

Annual AVMA Meeting

Denver, Colorado

August 14-18, 1960

Journal

OF THE
AMERICAN VETERINARY
MEDICAL ASSOCIATION



Foot Rot in Cattle — Chronic form with exostosis of pastern and coffin joints.
Page 589.





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orrhagiae Bacterin (Norden). Leptospira canicola and Leptospira icterohemorrhagiae are the serotypes most commonly associated with leptospirosis in dogs. A single 5 cc dose of Norden bacterin produces a rapid, high immunity response against both serotypes.

*Norden rabies vaccine is recommended, either Killed Virus, Caprine Origin or Live Virus Modified, Chick Embryo Origin.

Supplied In: 10-5 cc and 50 cc



Leptospira Canicola—Icterohemorrhagiae Bacterin

NORDEN LABORATORIES, INC., LINCOLN, NEBRASKA

Journal

OF THE
**AMERICAN VETERINARY
MEDICAL ASSOCIATION**

Vol. 136 No. 12 June 15, 1960

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EDITORIAL STAFF: D. A. Price, *Editor in Chief*; A. Freeman, *Assistant Editor*; H. E. Kingman, Jr., *Managing Editor*; Eva G. Bailey, *Production Manager and Assistant to the Editors*.

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Correspondence

April 6, 1960

Dear Sir:

I was interested in your article, "The Problem of Adulterated Milk and How It Affects the Veterinarian." I can hardly imagine a general practitioner who would not know that antibiotics given systemically would be found in milk from that animal. However, a warning is timely regarding the veterinarian's responsibility for preventing adulteration of milk.

Being in competition with feed stores, drug stores, and creameries in movement of antibiotics, I am concerned with their responsibilities. Are they not legally liable for milk adulteration if they fail to give proper warning?

Drug companies should be informed of their responsibilities, too. They mislead farmers into thinking that the problem of milk contamination is penicillin alone. They do not make it clear that other antibiotics and sulfas equal penicillin as contamination agents. Could not pressure be brought to bear to force honest advertising on these companies?

The JOURNAL of the AVMA has carried advertisements for products sold to farmers under a different name. Formulas are identical. Does this mean we are promoting lay products? Is this a case of "two-timing the profession" that we are willing to tolerate?

s/B. L. JOHNSON, D.V.M.
Arcadia, Wis.

[Editor's Note: Anyone proved responsible for adulterating milk may be penalized (see *J.A.V.M.A.*, April 1, 1960: 295-296). So far, no cases have come before the courts to indicate who may be considered responsible parties. Our objective is to prevent any veterinarian from becoming involved because he fails to properly advise a client.

The AVMA has only indirect control over advertising other than that which appears in its publications. The Council on Biological and Therapeutic Agents has already taken the steps to assure that only trustworthy and otherwise acceptable advertisements will appear in AVMA publications. More information about this will be published in a coming issue.]

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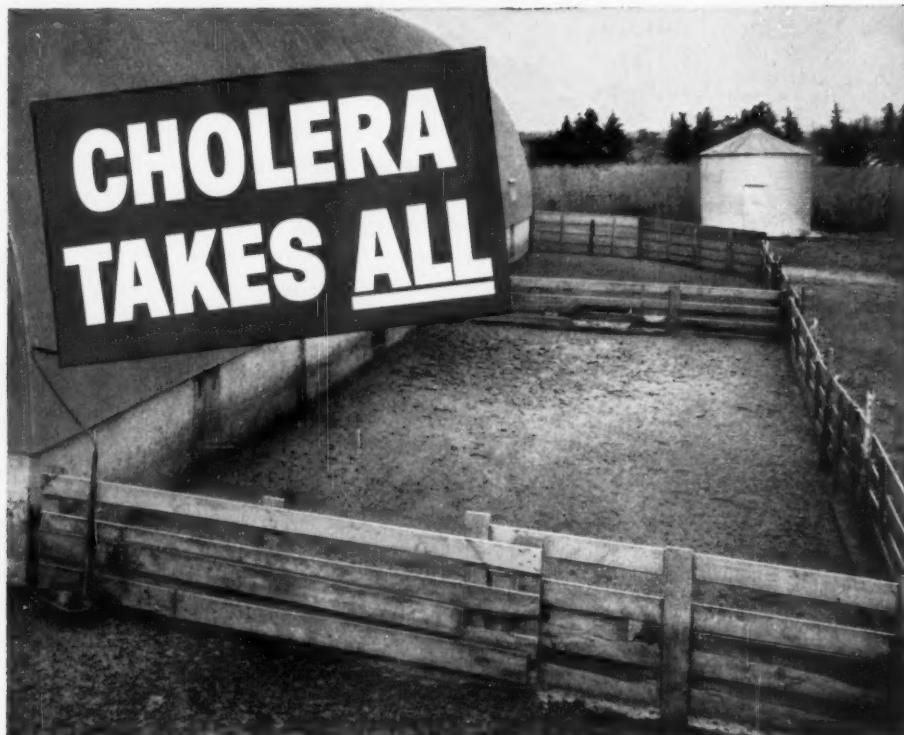
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hog cholera vaccine



FROM THE AVMA WASHINGTON OFFICE
J. A. McCallum, VMD
Brig. Gen. USA (Ret.)

LEGISLATIVE

Research, Disease Control, Meat Inspection in ARS Funds

USDA appropriations for fiscal year 1961, H.R. 12117, passed House May 12. Includes for ARS: research programs—\$67,934,000, of which \$600,000 is for staff and operation of Ames Laboratory and \$250,000 is for research on chemical and biological measures relative to hazards from pesticide residues; plant, animal disease and pest control—\$52,011,000, which includes \$19 million for brucellosis eradication; meat inspection—\$21,562,000, which permits continuation at 1960 level of operation.

Marketing Service Funds Exceed 26 Million Dollars

Funds for AMS marketing service per se totaled \$26,838,000, of which \$10,796,000 is for poultry inspection. An increase of \$500,000 for inspection at processing plants, was deleted when point of order was sustained in House against language relating to inspection of labels on cooked poultry products, point being it constitutes legislation in an appropriation bill. Undoubtedly all or most of funds will be restored when bill finally passes both Houses. (Note! House Report on bill is 1592.)

NEW BILLS

Humane Treatment of Test Animals

S. 3570—Sen. Cooper (R., Ky.) and 10 co-sponsors. To provide for the humane treatment of animals used in experiments and tests made by recipients of grants from U.S. and by agencies and instrumentalities of U.S. government.

Increase Resident Teaching Grant Funds

S. 3450—Sen. Ellender (D., La.). To amend section 22 (relates to endowment and support of colleges of agriculture and mechanic arts) of Act of June 29, 1935, to increase authorized appropriations for resident teaching grants to land-grant institutions.

(continued on adv. p. 8)



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when used with proper dose
of anti-hog cholera serum,
induces immediate,
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Available in:
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WASHINGTON NEWS—Continued

Free Mailing for Magazine Exchange

H.R. 12084—Rep. Fulton (R., Pa.). To provide free transmission in mails of magazines sent by certain nonprofit organizations in U.S. to similar organizations overseas.

MISCELLANEOUS

Dr. Francis J. Mulhern Honored

Dr. Francis J. Mulhern, Assistant Director Animal Disease Eradication Division, ARS, received the Department of Agriculture Distinguished Service Award for leadership in directing a nationwide cooperative program resulting in the successful eradication of vesicular exanthema.

Dr. James Lieberman Joins PHS Staff

The appointment of Dr. James Lieberman to be veterinary officer in the Regular Corps of Public Health Service was announced in Congressional Record, May 16, 1960.

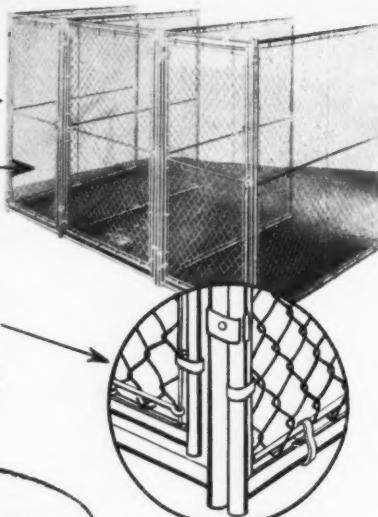
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*Weberlein, M.K., et al.: J.A.V.M.A. 134:518-519 (June 1) 1959.

Wyeth Laboratories Philadelphia 1, Pa.



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INJECTION: 50 mg. per cc., vials of 10, 30,
and 100 cc.

For further information on prescribing and administering
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Breed: English Cocker
Weight: 35 lbs.
Age: 3 yrs.
History: Vomiting and diarrhea (bloody), anorexia
Diagnosis: Gastroenteritis
Treatment: If signs worse
Drug: DIATHAL Dose: 1 cc.
Result: Vomiting and diarrhea stopped promptly;
given 2nd day appetite returned, fed
and beef; on 3rd day normal stool, normal
ite.



SYMPTOMS:

This report is for about 23
Cases treated as outpatients

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Results: Since starting this evaluation I treated many dogs as outpatients whose complaint was loose bowel movements (from moderate to severe). Regardless of size and weight I usually gave each dog 1 cc. of DIATHAL i.v. While I did not have the opportunity to check every case as follows, I had telephone reports on most and the results were almost universally good, e.g., the number of bowel movements usually decreased by 75% in 24 hours. I had no complaints of any toxic or rebound reactions.

more rapid, comprehensive control
of virtually all diarrheas
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- potent anticholinergic blocking action
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Injection

R, 10 cc. vial,
in G in dihydro-
n with diphenoxalin

Case R-752-58-13

Canine - Mixed Collie Weight - 45 lbs.
Male - 4 years

History - Vomiting and diarrhea for 3 days

Diagnosis - Gastroenteritis

Treatment - DIATHAL 2 cc. i.m.

Results - Dog quit vomiting in four hours- diarrhea
was still present however. Uneventful recovery.
This new preparation is much easier to handle
and work with than previous - much better
consistency.

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DIATHAL® procaine penicillin G in dihydrostreptomycin sulfate solution with diphenoxalin methylsulfate.

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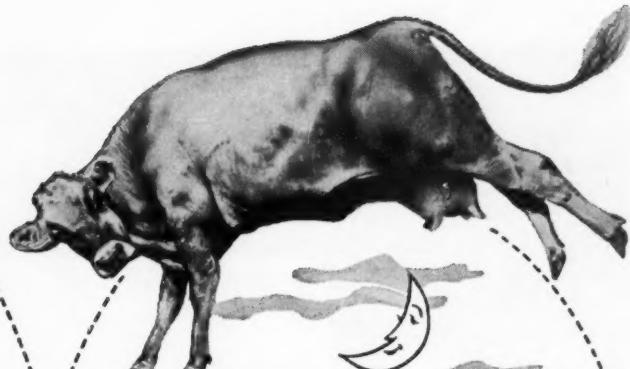
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the
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on
hot
weather!



N_LC wound treatments

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Also available in pints and gallons.

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With heavy base \$4.50
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their
chops



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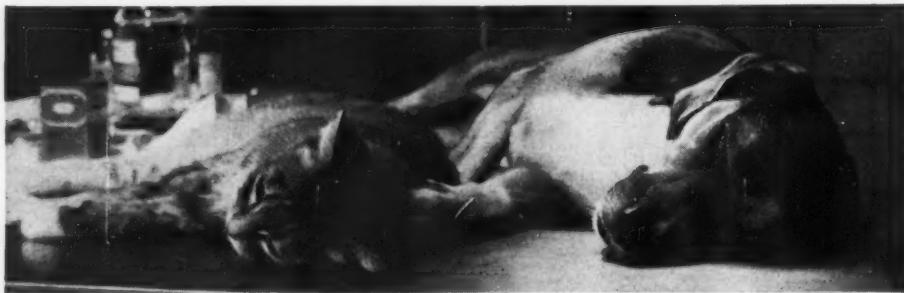
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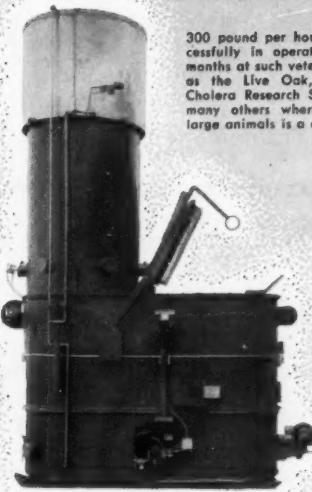
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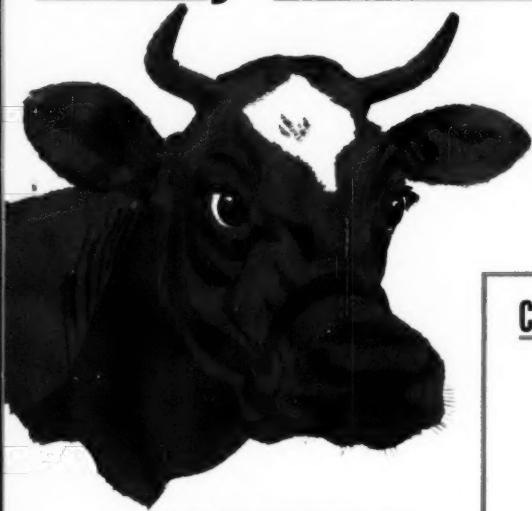
Recovery time varied from 2 to 7 days. There were no reactions to udder infusion.

Veterinary Professional Service Department
American Cyanamid Company
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URISED® VETERINARY ideal for small animals, too!

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DOSAGE: Dogs (average size)—two tablets Urised Veterinary three times daily.

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Dosage may be adjusted according to condition treated and effect desired. For long-term therapy, dosage may be decreased gradually to one tablet daily or as required.

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Relieves many urinary disorders—
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Check these outstanding advantages:

- Designed specifically for large animals
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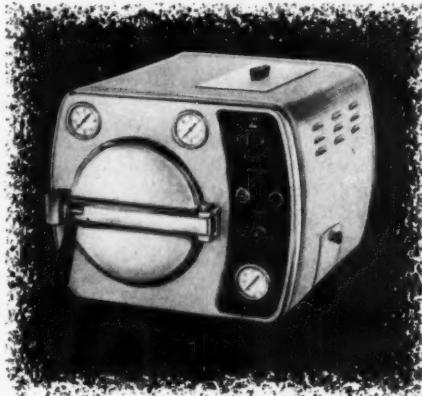
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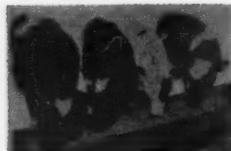
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Foot Rot in Cattle

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TRUE FOOT ROT is an acute or chronic infection of the foot characterized by necrosis of tissues in the interdigital space, and often complicated by suppurative arthritis of the coffin joint, pastern joint, or both.

Foot rot in cattle has many synonyms. Some of the most common names that have been used are: infectious pododermatitis, paronychia, pannaris, foul of the foot, hoof rot, and necrobacillosis of the bovine foot. Foot rot in cattle is not related to foot rot in sheep.

Etiology

Foot rot in cattle has been described in veterinary literature since the late 1800's.⁷ It would seem logical that during the ensuing years a disease of this economic importance would have been sufficiently studied to permit the establishment of a definite etiologic agent, pathogenesis, and treatment. Contrary to this, the primary etiologic agent has not yet been determined, although it seems undeniable that the organism *Spherothorax necrophorus* is involved as a secondary agent.² Injection of the digital arteries with a viable culture of

S. necrophorus does not produce typical lesions of foot rot² (fig. 17, 18).

Trauma, due to rough range pastures containing rocks, or exposure to mud with continual soaking of the foot in moisture and many contaminating organisms, are considered etiologic factors. Other conditions that may create an area of lowered resistance, such as laminitis, are probably factors influencing development of foot rot.

Incidence

Foot rot of cattle occurs in all sections of the United States. Severity varies considerably with geographic areas.

Foot rot is seen in all types and breeds of cattle. The highest incidence is in feedlot cattle, which may experience as high as an 80 per cent morbidity. In dairy and range cattle, herd morbidity is lower than in feedlot cattle.

Foot rot may occur in any season, but it is most likely to occur in fall and winter when cattle are often forced to stand in mud, snow, and ice.

Clinical Signs

Foot rot varies from a mild development of interdigital lesions to a severe phlegmonous involvement occurring in a high percentage of the herd. Usually more than 1 animal in a herd is involved. Examination

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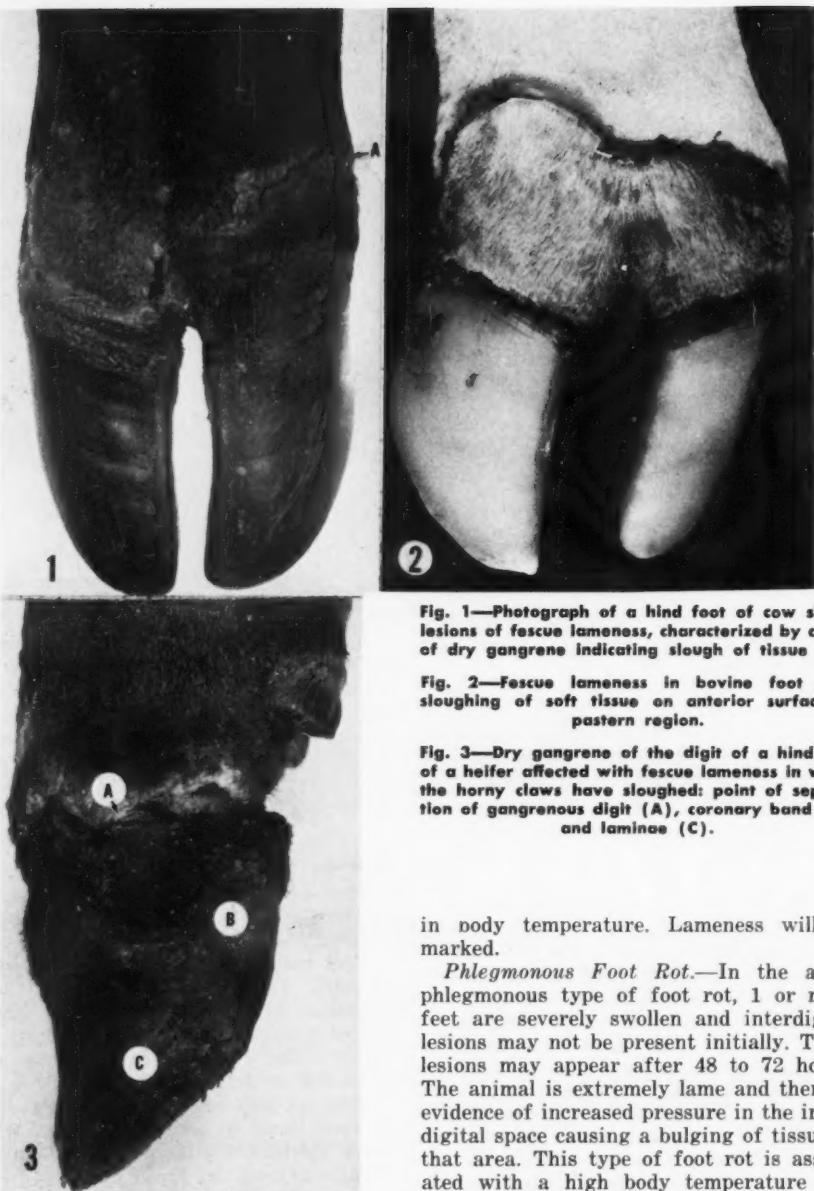


Fig. 1—Photograph of a hind foot of cow shows lesions of fescue lameness, characterized by a line of dry gangrene indicating slough of tissue (A).

Fig. 2—Fescue lameness in bovine foot with sloughing of soft tissue on anterior surface of pastern region.

Fig. 3—Dry gangrene of the digit of a hind foot of a heifer affected with fescue lameness in which the horny claws have sloughed: point of separation of gangrenous digit (A), coronary band (B), and laminæ (C).

in body temperature. Lameness will be marked.

Phlegmonous Foot Rot.—In the acute phlegmonous type of foot rot, 1 or more feet are severely swollen and interdigital lesions may not be present initially. These lesions may appear after 48 to 72 hours. The animal is extremely lame and there is evidence of increased pressure in the interdigital space causing a bulging of tissue in that area. This type of foot rot is associated with a high body temperature and usually a high morbidity in the herd.

Mild Foot Rot.—Occasionally, in some geographic areas, mild cases of foot rot are seen in which only interdigital lesions are present. Swelling is minimal and lameness is not severe. These mild lesions can be treated locally with tincture of iodine,

of the affected foot or feet will, in most cases, reveal interdigital lesions that show necrosis of the interdigital space (fig. 20). There will be swelling in the region of the coronary band that may extend to the fetlock joint. There may or may not be a rise



Fig. 4—View of distal extremity of the tail from a steer affected with fescue lameness shows sloughing of tip.

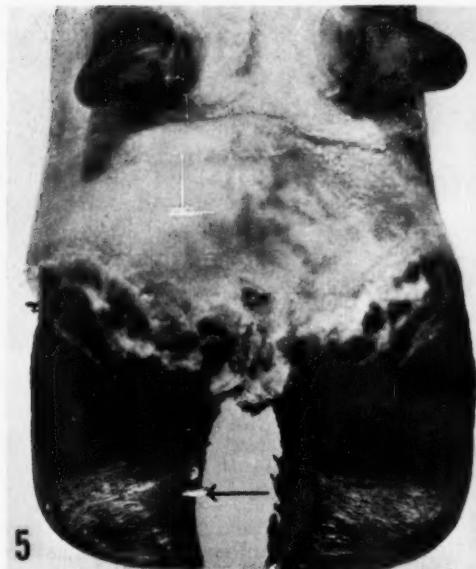


Fig. 5—Posterior aspect of bovine foot shows penetration of the heel by a large nail (arrow).



Fig. 6—Radiograph of foot shown in figure 5 shows penetrating nail (x).

sulfonamide ointments, and organic iodine compounds, and the animals will usually recover with little difficulty. This type of foot rot is not being considered in this paper.

Chronic Foot Rot.—Chronic foot rot results when the coffin joint, pastern joint, or both become involved (fig. 13-16). The animal remains lame for a long time, until the affected digit is removed or ankylosis takes place.

Diagnosis

Diagnosis is based on clinical signs, history, and physical examination.

If the case has been clinically diagnosed as foot rot, and the animal does not respond to routine treatment, the foot should be re-examined for pathologic invasion of the coffin or pastern joints with resultant suppurative arthritis. Coffin or pastern joint involvement results in prolonged, persistent lameness. These affected joints continuously discharge exudates through tracts that open into the interdigital space or around the coronary band. The use of radiography



Fig. 7—Radiograph of a bovine foot shows encirclement of a claw by a piece of wire. This caused gangrene of the hoof wall and a lameness similar to foot rot.



Fig. 8—Skin dissected from posterior aspect of bovine foot shows filth dermatitis (verrucous dermatitis).

for diagnosis is essential in determining the extent of the invasion of the joints and bone (fig. 12, 14, 16).

Differential Diagnosis

Some conditions that should be considered in differential diagnosis of foot rot are:

1) *Fescue Lameness (Fescue Foot)*.—Fescue lameness has been described as "a noninfectious disease of cattle, characterized by dry gangrene of the hind feet and tail, and caused by excessive consumption of tall fescue grass, *Festuca elatior*"⁶ (fig. 4). Lameness is severe and could easily be confused with foot rot (fig. 1-3). If the cattle are allowed to continue eating fescue grass, the foot will slough completely at the coffin or pastern joint in most cases. Close examination of the foot will reveal a line of dry gangrene which may be secondarily invaded by bacteria such as *Sphaerophorus necrophorus*. There will be no response to treatment for foot rot and it is important that a differential diagnosis be made. A high percentage of cattle in the herd may be affected and a delay in proper diagnosis may cause many cattle to suffer from dry gangrene, whereas if the grass were removed from the diet, complications could be avoided. Fescue grass in pasture or hay must be ingested for cattle to develop fescue lameness.

2) *Interdigital Fibroma (Corns, Quitotor)*.—Interdigital fibroma may follow a case of foot rot, possibly due to the irritation in the interdigital space. Interdigital fibroma may cause severe pain in 1 or more feet and the lameness is not distinguishable from that of foot rot. In many cases of interdigital fibroma, only a small portion of the fibroma is visible, with the bulk of the growth located between the claws and invisible without cleaning and complete examination of the foot.

The usual therapy for foot rot will have no effect upon this condition. The fibroma must be removed surgically to accomplish recovery.

3) *Sole Abscesses and Undermining of the Sole*.—Sole abscesses are difficult to detect without casting the animal and thoroughly examining the sole. The abscesses are identified by a discolored area on the sole. Peeling away the overgrown wall that has formed a false sole will reveal

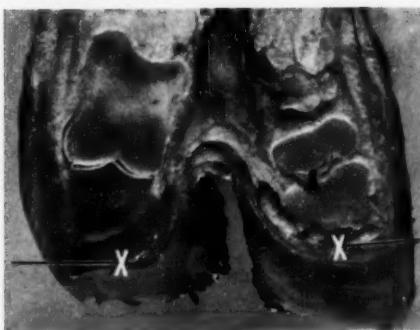


Fig. 9—Longitudinal section of bovine foot shows degeneration of a coffin joint (A) severe laminitis with separation of the laminae (X).



Fig. 10—Longitudinal section of a bovine foot shows complete obliteration and fibrosis of coffin joint (A). Normal coffin joint is at left.

these areas. When these are opened, an exudate will be present. A large area of the sole may be undermined by the abscess. Exudate may be present at the heel.

Infection also can start at the junction of the periople of the heel and the coronary band, undermining the entire sole and causing a severe lameness as well as a sole abscess. These lesions cause some redness above the coronary band and may be mistaken for foot rot.

Therapy for foot rot will result in only minor improvement in these conditions, and may lead to the mistaken diagnosis of suppurative arthritis of the coffin joint because the lameness persists. Sole abscesses must be treated by complete extirpation of the involved portion of the sole, bandaging of the foot with proper antibiotic agents, and maintenance of box stall cleanliness for a considerable time.

4) *Foreign Bodies in the Foot*.—Puncture wounds by splinters, nails, staples, and other foreign objects must always be considered in the diagnosis of foot rot (fig. 5,6). To rule out this possibility requires a complete examination of the animal. Another type of foreign body that should be considered is a piece of wire that in some way encircles the claw, causing necrosis

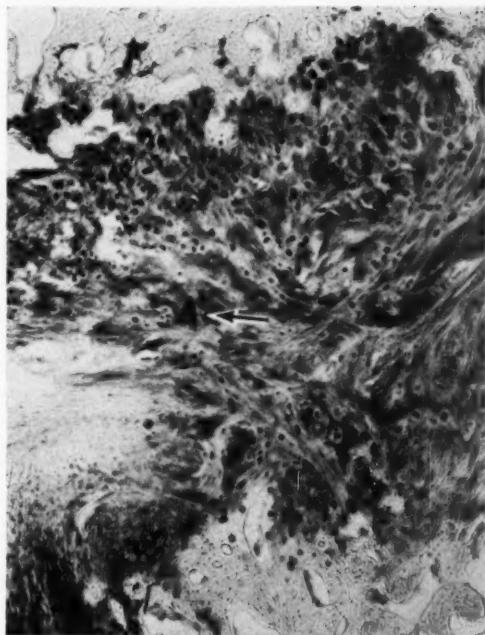


Fig. 11—Histologic section of coffin joint space after involvement with foot rot shows transformation of cells to a cartilaginous type throughout the entire area (A).



Fig. 12—Radiograph of foot in figure 10 shows arthritis of coffin joint (A).

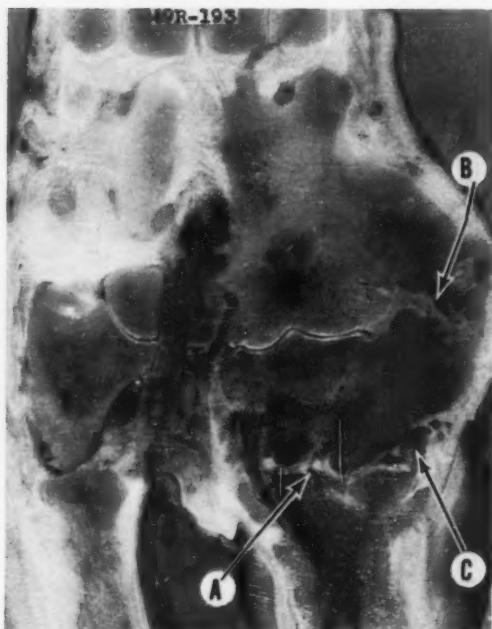


Fig. 13—Longitudinal cut section of bovine foot shows obliteration and fibrosis of coffin joint (A), exostosis around the pastern joints (B), and exostosis around coffin joint (C).

near the coronary band and secondary infection (fig. 7). Most of these lesions cause lameness similar to those of foot rot. Physical changes, such as reddening around the coronary band and swelling of the foot, may be observed. Routine therapy for foot rot will be unsuccessful.

5) *Filth Dermatitis (Verrucose Dermatitis¹)*.—Severe dermatitis sometimes develops around the volar or plantar areas of the foot, ascending from the heel to the region above the dewclaws. This occurs as a moist eczematous-type lesion that enables infection to penetrate the layers of the skin (fig. 8). Lameness will vary markedly in severity. When the area is thoroughly cleansed, it will be found that the skin is broken by numerous cracks. The etiologic agent is not definitely known, but filth undoubtedly is a factor.

The lesion is treated by thorough cleansing of the area, application of local antibiotic therapy, and placing the animal in clean premises.

6) *Injuries to the Locomotor Apparatus of the Foot*.—Usually, sprains in this region are limited to the fetlock region. The swelling of the fetlock joint is obvious and the inflammation usually does not extend to the coronary band. Lameness is often severe, but sprains can be differentiated

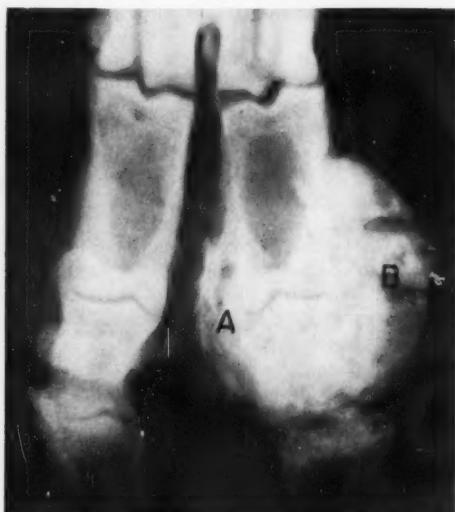


Fig. 14—Radiograph of foot in figure 13 shows exostosis on medial side of pastern joint (A), and on lateral side of pastern joint (B).



Fig. 15—Anterior view of bovine foot shows severe foot rot, with drainage tracts from affected joints (A,B). These tracts could be confused with fescue lameness.

from foot rot by adequate physical examination.

Other conditions that may occur in this area that cause acute lameness are osteitis and arthritis. These may or may not be due to infectious causes and must be differentiated by radiographic examination. With noninfectious causes, there will be no drainage to the outside, although there may be considerable swelling in the region of the coronary band. When these conditions have been present for a considerable length of time, there will be changes in the shape of the affected claw resulting from prolonged inflammation.

Fractures of the phalanges do occur, and radiographs are necessary for diagnosis.

7) *Laminitis*.—Laminitis is usually characterized by inflammation in all the feet. Heat, with little swelling, is present above the coronary band. A hoof tester will reveal that sole pressure causes severe pain in both claws. Examination of the foot reveals no external lesion. Laminitis usually develops in feedlot animals on high grain ration, when on any given day or days they consume more concentrates than usual. Laminitis rarely appears in the animal that is acutely foundered from overloading on grain.

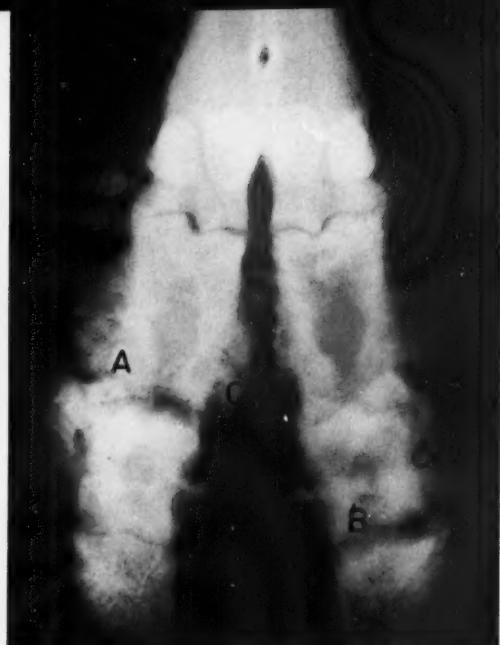


Fig. 16—Radiograph of foot in figure 15 shows severe involvement of pastern joint (A), involvement of coffin joint (B), and exostosis around these respective joints (C).

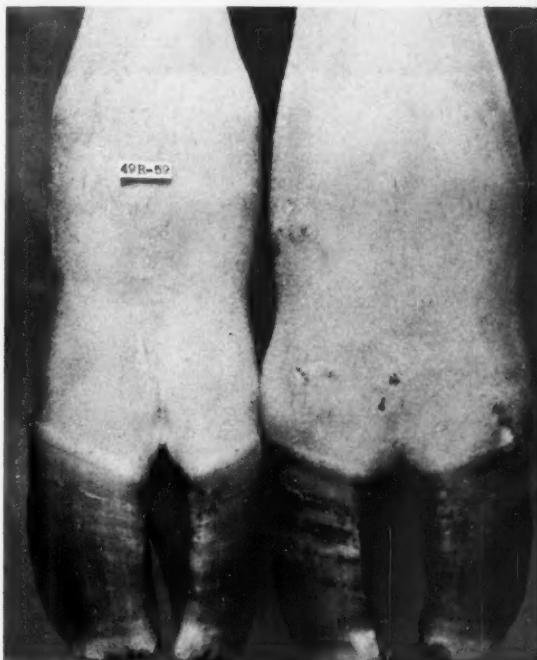
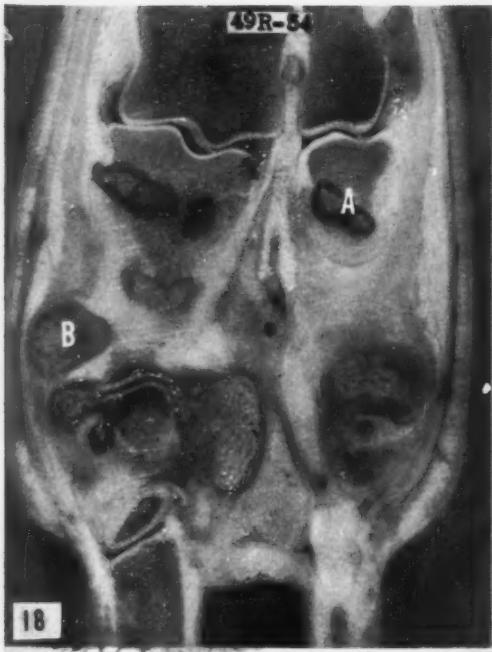


Fig. 17—Normal foot (left) and diseased foot (right). A viable culture of *Sphaerophorous necrophorus* was injected in the digital arteries of a steer in an attempt to reproduce foot rot. The swelling is higher than occurs when foot rot occurs naturally.



18

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A

B



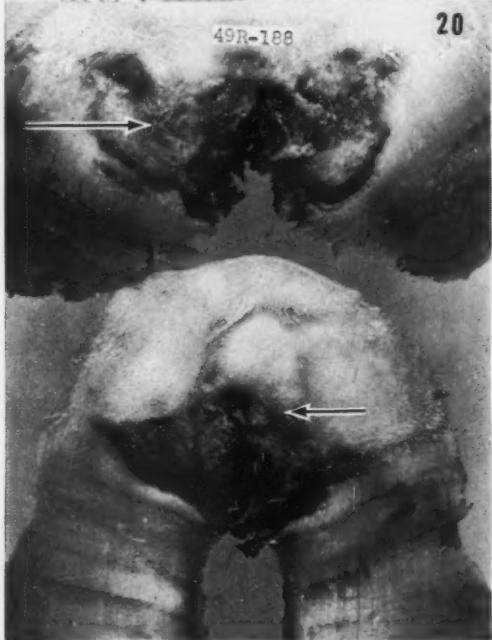
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2

Fig. 18—Longitudinal section of foot shown in figure 17 shows osteitis focus of infection in the second phalanx (A), and connective tissue abscess (B). The interdigital space is normal.

Fig. 19—Longitudinal section of bovine foot shows abscesses in the tendon sheaths (1,2).



20

49R-188

Fig. 20—Posterior (above) and anterior (below) aspects of the bovine foot shows typical foot rot. Dermatitis lesions are present (arrows).

In an examination of 116 cattle feet, a high percentage of laminitis was reported.² It is possible that laminitis results in an area of lowered resistance allowing pathologic development by *S. necrophorus* organisms.

Pathology

In a study of pathology of the bovine foot, "true foot rot" was classified on the basis of the lesions involving only the interdigital skin, interdigital connective tissue, and coffin joints.² Osteitis, arthritis of the pastern and fetlock joints, and laminitis could be considered complications of true foot rot, since tissues listed above were not primarily involved. Laminitis is present to a variable degree in foot rot.

Many cases of foot rot are associated

with a local dermatitis and it could be that, in some way, this dermatitis offers entrance to *S. necrophorus*, which then causes necrosis of the interdigital connective tissue (fig. 20). The inflammatory lesions may spread to the coffin joint, tendon sheaths, and to other connective tissue from the interdigital lesion (fig. 19). The inflammatory process in the interdigital connective tissue is of a necrotizing type from activity by *S. necrophorus*.

Involvement of the coffin joint is a common complication of foot rot. In some cases, the entry of the infection into the joint is so rapid it would lead one to believe that once the inflammatory process has started in the interdigital connective tissue, it may go directly to the coffin joint. It was once an accepted belief that foot rot must be present for considerable time before involvement of the joint would occur. However, in the experience of the author, some animals that have been lame only 48 to 72 hours have coffin joint infection. Once the coffin joint is involved, the animal will be lame for a long time and will experience considerable weight loss if the affected claw is not removed (fig. 9, 13). The pastern joint may also be involved with a suppurative arthritis.

Occasionally these lesions will heal without treatment after several months. The joint becomes completely fibrosed, with some tendency for this fibrotic tissue to transform to cartilage² (fig. 10,11). Exostosis will often form around these involved joints as evidenced by radiographic exami-

nation (fig. 12, 14). Once the joint is completely immobilized, the animal can usually walk in a satisfactory manner.

If the inflammatory process is successful in walling off the inflammation and the lesion heals, there will be a considerable increase of connective tissue in the interdigital region (fig. 21). The inflammatory process may also result in abnormal hoof wall growth which will require the animal to have foot trimming more often than would ordinarily be necessary.

Treatment of Foot Rot

1) Early Cases of Acute Foot Rot that Have Not Invaded the Coffin Joint.—Treatment with intravenous sodium sulfapyridine, sodium sulfamerazine, or sodium sulfamethazine at the rate of 1 gr. per pound of body weight daily for 3 days is effective. Antibiotic therapy such as penicillin-streptomycin mixtures or broad-spectrum antibiotics in high level dosages will also usually be effective. Sodium sulfapyridine gives the most consistent results of the sulfonamides, in my experience. Penicillin should be given at the rate of 4 to 6 million units per day and, if streptomycin is used in conjunction, the dosage rate is 5 Gm. per day. Penicillin, streptomycin, and sulfonamide therapy may be combined in severe cases.

Broad-spectrum antibiotics such as tetracycline, oxytetracycline, and chlortetracycline should be given at the rate of 2 to 5

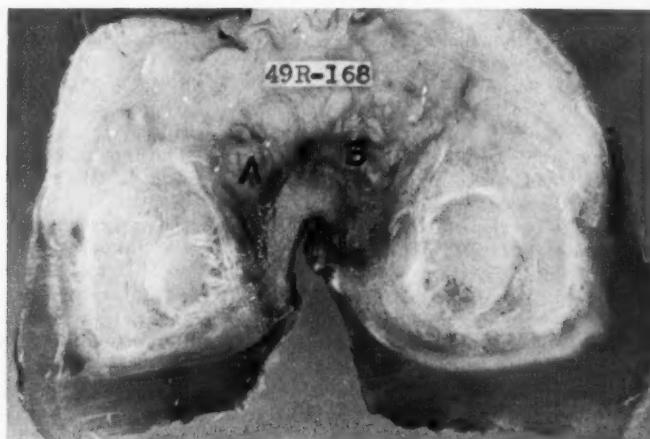


Fig. 21—Cross-section of a foot with foot rot shows necrosis and an increase of interdigital connective tissue (A,B).

mg./lb. of body weight per day. The sodium sulfonamides and the broad-spectrum antibiotics may be given intravenously or intraperitoneally. The broad-spectrum antibiotics may also be given intramuscularly, but the intravenous route is preferred; they are not used in conjunction with penicillin.

It is important to continue therapy for 3 days, whenever practical, so that the cattle will have a chance to overcome infection. Occasionally cattle have recovered after one treatment with these drugs;^{3,4} however, if the therapy is not continued there is the risk of relapse and joint involvement. When possible, local cleansing and local treatment of the interdigital lesion is of value.

It is essential that all cattle that show even slight lameness receive immediate and adequate therapy.

2) *Phlegmonous Type of Foot Rot.*—When treated with antibiotics or intravenous sodium sulfonamides, as previously mentioned, cattle with acute foot rot usually respond well.

3) *Coffin or Pastern Joint Involvement.*—Once a joint is involved, the affected claw should be removed. The site of amputation varies with the joint involved. Response is usually more favorable with amputation of the claw on a front foot than a hind foot. Removal of the claw is accomplished by casting the animal and thoroughly cleansing and preparing the area for surgery. Local anesthetic is used for complete ring block above the fetlock joint. A rubber tourniquet is applied above the fetlock.

Incisions are made down the anterior and posterior side of the pastern joint in the region of the first and second phalanx. The skin is then incised on the medial and lateral side of the claw near the coronary band.⁵ The flap of skin is raised so that the bone may be cut through the first phalanx with a Benesch wire saw or so that the pastern joint may be disarticulated, depending on the extent of the involvement. If the bone is cut with a wire saw, the first phalanx is beveled so that the skin flap will fit smoothly over it with no sharp projections. To do this, the bone is cut from the interdigital space, laterally and upward. If the pastern joint is disarticulated, the articular end of the first phalanx should be scraped so that there will be no synovial secretion. The skin flap is sutured and the foot is bandaged after application of antibiotic powder. The animal must then re-

main on clean premises and the bandage should be changed as often as necessary.

Medication as previously outlined is used in conjunction with amputation when an elevated temperature is present.

Prolonged bandaging with tar and oakum often causes the tissues to become moist and devitalized. The sutures may be lost as a result of this devitalization of tissue and the moistness predisposes the formation of exuberant granulation tissue. If the foot is kept properly bandaged and cleaned, the healing period is much shorter.

If only the coffin joint is involved, the claw may be removed by low amputation. Surgical cleansing, local ring block above the fetlock joint, and tourniquet are used as above. The claw is cut with a Benesch wire saw $\frac{1}{2}$ inch below the coronary band until only the posterior third of the claw remains. Then the wire is directed distally toward the sole surface of the claw. A portion of the third phalanx will remain. The piece of third phalanx is removed and the articular surface of the second phalanx is curetted. Antibiotic powders are applied, and the foot is kept bandaged. The animal is kept in dry premises until healing is completed. A modified hoof will grow which will allow weight bearing.

In bulls, another method of treatment for involvement of the coffin or pastern joints may be used. This is a method of treatment for involvement of a claw when claw amputation may cause impairment of breeding ability.

The suppurative tracts and the involved joint surfaces are curetted thoroughly. Setons are then placed in the tracts that have been thoroughly curetted and the foot is bandaged after application of antibiotic or antiseptic powders or ointments. After 10 days, bandages are removed and the wounds are left exposed. Drugs such as tincture of iodine are applied to the tracts. The foot is soaked daily in magnesium sulfate. Healing time may require up to 4 months. If the lesion heals successfully, the affected joints will be ankylosed and the animal will have better use of the foot than if the claw were amputated. The disadvantage of this approach is that the healing period is prolonged and the bull may lose considerable weight.

Cases of foot rot that are allowed to progress without treatment may develop connective tissue abscesses near the fetlock joint and a suppurative tendinitis high up

the leg in addition to suppurative arthritis (fig. 19).

Prevention

Prevention of foot rot is obviously better than treatment, which may cost the owner more than his profits on the animals. Sixty per cent or more of the total cattle may be involved.

Many cases occur in feedlots during fall and winter. If possible, it is best to have concrete aprons along the water tank and feedbunks since this, in part, allows the cattle to avoid constantly standing in deep mud. Whenever practical, slaked lime should be applied daily to any area where the cattle tend to congregate and stand in mud, such as in front of feedbunks and around water troughs. It is essential that the corrals be cleaned as thoroughly as possible. Cleansing of the corral area is, of course, dependent upon weather conditions. Cleansing of the corrals, new bedding, and application of slaked lime are good sanitary measures. In foot rot in range cattle, it is often hard to explain why the disease occurs, and of course the foregoing methods do not necessarily apply except in application of slaked lime around water tanks and other areas of concentration. Where the cattle drink from a stream, this is not a practical procedure.

Feeding of organic iodides at the rate of 1 lb./50 lb. of crushed salt or 1 lb./500 lb. of grain, has been recommended as aiding in prevention of foot rot. In my experience, this method has been of doubtful value.

Summary

True foot rot is an acute or chronic infection of the foot characterized by necrosis of tissues of the interdigital space and often complicated by coffin or pastern joint suppurative arthritis. Foot rot varies in character from mild interdigital lesions to

a severe phlegmon that involves a high percentage of the herd. Dermatitis is often present and is a major factor in the cause of the disease. The importance of establishing an accurate diagnosis of foot rot cannot be overemphasized. There are a number of conditions that may resemble foot rot but which do not respond to the therapy ordinarily used for foot rot. Early, accurate diagnosis of the condition is also important for an accurate prognosis.

The milder forms of foot rot and the severe phlegmonous type that have not invaded the coffin or pastern joints will still respond to routine therapy in the early stages. It is important to continue this therapy for an adequate time so that relapses, which would eventually involve the coffin joint, will not occur. An increasing number of cases of foot rot involve the coffin joint in a short time. Involvement of the pastern joint and complications in the tendon sheaths may also occur. Amputation should be accomplished as early as possible when the coffin or pastern joints are involved. Antibiotic or sulfonamide therapy is of little value in these cases until the claw is removed.

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Evaluation of Prednisone for Mastitis

Antibiotic ointment, with or without 4.5 mg. of prednisone acetate, was instilled into 62 mastitic quarters. Leukocyte counts and results of the California Mastitis Test showed that prednisone did not hasten recovery.—*Vet. Bull.* (1960): Item 614.

How Veterinarians Look at Their

Changing Profession

Everett M. ROGERS, PH.D.
William H. FEIGH, D.V.M.

THE VETERINARY profession is dynamic and changing. It is characterized by a trend toward increasing specialization and away from general practice. Increased emphasis on research and on new drugs and equipment is apparent. The image that the public holds of the veterinarian also may be changing.

Almost every veterinarian seems to hold an opinion of whether these changes in his profession are favorable or unfavorable. This article reports the results of a research study in which 81 veterinarians were asked their opinion about their own profession. This modest study was exploratory; the sample is limited in scope and small in number. However, it is hoped that the findings may provide guidance to leaders of the veterinary profession who attempt to keep close to the changing pulse of the profession and who will help steer its course in the future.

Methodology

In 1959, a questionnaire was mailed to 127 alumni of the Ohio State University College of Veterinary Medicine who had been graduated in 1949 and 1953. Responses were received from 81 (about 64%) of these veterinarians. The respondents had 6 and 10 years of professional experience, respectively, which should provide an adequate opportunity for them to observe changes in their profession. The respondents were promised that their answers would be held in confidence and that their names would not be connected with

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their opinions. There is little evidence that the respondents were motivated to supply biased or untrue answers.

The 81 respondents from which data were received were engaged in the following occupations: 33 per cent were in large animal practice, 38 per cent were in small animal practice, 7 per cent were equally in small and large animal practice, and 22 per cent were in teaching and research. Thirty-five of the respondents resided in Ohio; the remainder were scattered over 17 states and the District of Columbia.

The information from the mailed questionnaires was supplemented with personal interviews with about 15 practicing veterinarians in central Ohio. The personal interviews were useful as a means to secure additional data and deeper understanding of points raised by the mailed responses.

Findings

1) "Within the next 10 years, the veterinary profession will be just as specialized as the medical profession. Do you agree or disagree? Why?"

About three-fourths of the respondents in the present study disagreed with this statement; they generally felt that while there was a definite trend toward specialization in the veterinary profession, it would not be as specialized as the medical profession in 10 years. On the contrary, almost one fourth of the respondents felt the veterinary profession would be as specialized as the medical profession in 10 years.

A content analysis of the respondents' opinions indicated that many felt their profession never would be as specialized as the medical profession but that the trend

was in that direction. Typical replies follow:

I believe there is a definite trend in the direction of specialization, but until our men and schools are better equipped for specialization, it will not progress to the extent of human medicine.

The public is demanding prompt service in both large and small animal fields; only the man that devotes his time to one or the other can best serve them.

We won't catch up [in specialization] until we're divorced from agriculture and married to medicine.

Veterinary medicine may become somewhat more specialized than it is now but never as specialized as human medicine. Business isn't good enough even in large cities for a veterinarian to become an eye, ear, nose and throat specialist.

While there is a trend toward specialization, general practice will continue to be needed in rural areas to a greater degree than will specialized practice.

Several of the respondents agreed that specialization will increase, but that economic factors would prevent a degree of specialization comparable to that in the medical profession. Replies indicating this attitude were:

There will be specialization, but due to our profession being more closely controlled by economics, it will never be as highly specialized as the medical profession.

Fewer mixed practices in the future. There will be more concentration in specific phases of the profession, but the economy of our profession will prevent our specializing.

Other veterinarians who answered the questionnaire felt that economic pressures would tend to increase specialization. For example, "Economics will determine a higher degree of specialization," and "Specialization will be forced because of economics." One respondent said, "We'd better be specialized, or we've had it."

A somewhat facetious response was received from one veterinarian, "Can't you just see a card like this?"

Dr. John Smith
Veterinary Gynecologist
Chihuahuas Only
By Referral

In summary, there was general agreement among the respondents that specialization would increase in veterinary medicine, but that it would not approach the specialization of the medical profession.

2) *"The public feels that the veterinary profession is one of routine skills that can be acquired with little or no previous training. Do you agree or disagree? Why?"*

About 28 per cent of the respondents agreed that the public held this opinion. Following are typical replies.

This lies at the door of the veterinary profession. Educating the public, and explaining in general terms why certain procedures are used under varying conditions will do much to gain the farmers' respect for professional knowledge.

Some of the public still believe our training is only a 6-month apprenticeship with an older practitioner.

Many people do not realize the training that is required. There is a tendency to put the veterinarian on the same plane as the plumber.

Almost 72 per cent of the respondents disagreed with the statement that the public views their profession as one of routine . . . skills acquired with little training. But most of those veterinarians who disagreed tended to qualify their statements in some way.

I disagree, but few people fully realize the length of our training.

Most people realize it takes a college degree but few know it takes at least 6 years.

I disagree because, while this feeling is still existent, more veterinarians take time to do a little "education" with their clients.

In summary, most respondents felt the public had a generally accurate image of their training but that further public relations efforts were needed in this direction.

3) *"A veterinarian's personality is the most important single factor in determining his success. Do you agree or disagree? Why?"*

Almost 70 per cent of the respondents agreed with this statement, and even those who disagreed were willing to admit that personality was of some importance in determining success.

Personality is the most dominating factor, since your reputation rests on service rendered. This is particularly true in small animal practice.

If an individual has enough intelligence to graduate from veterinary school, he has enough knowledge to practice. His success then depends on his personality or ability to communicate with his clients.

He must learn to "treat" the owner along with the animal.

We see it every day—the veterinarian who can sell himself will have 2 or 3 times the practice of the veterinarian who does the best job.

The respondents generally emphasized the importance of a veterinarian's personality as a key factor in his success, some even suggested a need for college courses on the topic. Nevertheless, the responses

indicated a great deal of vagueness in the meaning of the term "personality;" most veterinarians who answered our questionnaire evidently interpreted the term particularly in terms of veterinarian-client relationships.

Summary

Data from 81 veterinarians indicated general agreement that their profession was becoming more specialized, that the

public was generally becoming more aware of the nature of their professional training, and that a veterinarian's personality was a key factor in his success. This study was exploratory in nature and small in scope; it is suggestive of future research. A need seems indicated for sociologists and veterinarians to collaborate on research studies of the human relationships of the practitioner, of the changing roles of the student veterinarian, of the diffusion of new ideas and drugs, and of social factors in professional success.

British Veterinarians Doing Well

The *Economist*, a British weekly, reports that Britain's 4,600 veterinary surgeons never had it so good.

Their potential patients number 3½ million dogs, 5 million cats, 6½ million cage birds, 200,000 horses, 45 million cattle, sheep, and hogs; 100 million poultry; and other pet and zoological animals too numerous to mention.

All but 15 per cent of the British veterinarians working for the ministry of agriculture are in private practice. Their starting pay is good. The profession has grown in public respect. There is no prescribed scale of fees, and income may depend on the veterinarian's stamina. Sale price of a fair urban practice is about \$42,000.

The *Economist* says the veterinarian's position compares favorably with that of the medical general practitioner which is considered to be failing in the promiscuous drudgery of the nationalized health service.

This will explain why many talented young men are turning to veterinary medicine, for as the *Economist* remarks, "an animal health service is still far enough off for the idea to be one to make a cat laugh."

And the publication could have added: Animals can't vote.—
A.M.A. News, April 4, 1960.

Radiographic Anatomy of the

Canine Pelvic Limb

Part II. Developing Limb

W. C. D. HARE, PH.D., M.R.C.V.S.

THE PURPOSE of this paper is to outline briefly the postnatal skeletal development of the pelvic limb and to illustrate, by means of roentgenographs and labeled tracings, the location of the various centers of ossification and the epiphyseal lines.

The dates for the ossification process given in this paper should be considered approximate ones for the same reasons that were put forward in an earlier paper.² They have been based on the author's own observations and those of other workers for the appearance of the ossification centers^{1,4,5} and the times of epiphyseal union.^{3,6-8} The criterion for the appearance of an ossification center was taken to be the appearance of an opaque area on the roentgenograph, and epiphyseal union was considered to have occurred when the epiphyseal plate had disappeared and bony trabeculae could be seen passing from the diaphysis to the epiphysis along the entire length of the epiphyseal line.

Positioning and Technique

The dogs were anesthetized with barbiturates and positioned as described below and in part I of the paper.³

The mediolateral view of the proximal end of the femur (fig. 6) was obtained by first laying the dog on the same side as the limb to be radiographed. The upper pelvic limb was then abducted and retracted until it was out of the path of the x rays, with the result that the pelvis was



Fig. 1—Photograph of the distal surface of a femoral diaphysis (top of the bone is the cranial aspect).

tilted. Par-speed screens and regular films were used with a Potter-Bucky diaphragm. The central ray was directed to the proximal end of the femur.

The lateral view of the pelvis (fig. 5) was obtained by laying the dog on its side with the one pelvic limb on top of the other. Par-speed screens and regular film were used with a Potter-Bucky diaphragm. The central ray was directed to the trochanter major of the femur.

Ossification Process

Each os coxae develops from 7 or 8 centers of ossification. There is one center each for the ilium, ischium, pubis, os acetabulum, crest of the ilium, and tuber ischii. The ischial arch develops from one or more centers and, in addition, there is a separate center for a small, wedge-shaped piece of bone located at the caudal end of the symphysis pelvis.

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The author acknowledges the advice and encouragement of his colleagues in the anatomy laboratory, and the photographic work of Mr. A. Marfaing, Wistar Institute.



Fig. 2—Ventrordorsal view of the pelvis and the coxofemoral articulations of a 69-day-old female Scotch Collie dog.

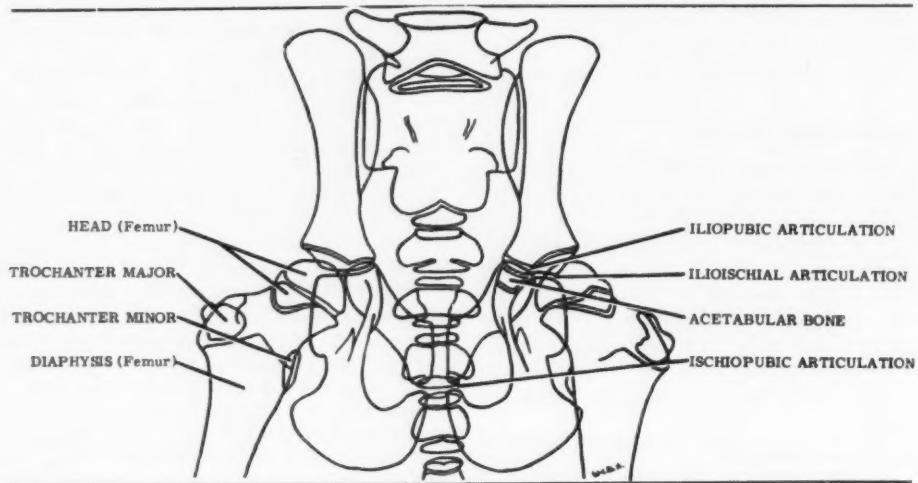


Fig. 3—Labeled tracing of figure 2.



Fig. 4—Ventrordorsal view of the pelvis and the coxofemoral articulations of a 6-month-old Scotch Collie dog: (A) a center for the ischial arch; (B) wedge-shaped piece of bone; (C) center for the tuber ischii; (D) epiphyseal cartilage between the trochanter major and the diaphysis; (E) epiphyseal cartilage between the head and the diaphysis; (F) center for the crest of the ilium.



Fig. 5—Lateral view of the pelvis and the coxo-femoral articulations of a 6-month-old female Scotch Collie dog: (A) wedge-shaped piece of bone, (B) center for the crest of the ilium.



Fig. 6—Mediolateral view of the proximal end of the right femur of a 7½-month-old female German Shepherd Dog.

Fig. 7—Labeled tracing of figure 6.

The ilium, ischium, and pubis are partly ossified at birth, but are quite separate from one another. As growth proceeds, these 3 bones approximate each other in the region of the acetabulum, while the ischium and pubis grow closer together along the symphysis pelvis (fig. 2, 3). The center for the os acetabulum is difficult to distinguish radiographically, but it appears during the third month in the cranoventral part of the acetabulum between the ilium, ischium, and pubis (fig. 2, 3). The ilium, ischium, pubis, and os acetabulum, and the ischium and pubis unite during the fifth or early in the sixth month. The center for the tuber ischii appears during the third month and unites with the ischium during the tenth, eleventh, or twelfth month (fig. 4). The center for the crest of the ilium appears during the fourth or fifth month (fig. 4, 5). Union of the crest with the ilium starts at the caudal end of the crest and proceeds cranially. It can occur over an extended age period; in some dogs, it starts as early as the thirteenth month and, in others, it is still incomplete at 2½ years. The center for the wedge-shaped piece of bone appears during the fifth month, and the 1 or more centers for the ischial arch during the sixth month (fig. 4). The ischial arch unites with the ischium during the thirteenth month. The ossa coxarum start to unite at the caudal end of the symphysis pelvis by uniting with the wedge-shaped piece of bone. Union is not complete in some dogs until the fifth or sixth year.

The femur develops from 5 centers of ossification, 1 each for the diaphysis, head, trochanter major, trochanter minor, and distal epiphysis. The diaphysis is ossified at birth. The center for the head appears

during the first or second week at the proximal end of the diaphysis. The centers for the trochanteres major and minor appear during the seventh, eighth, or ninth week, at which age the neck of the femur has been formed.

In a ventrodorsal view (fig. 2-4), the center for the trochanter major can be seen on the lateral side of the proximal end of the diaphysis, and the one for the trochanter minor on the medial border of the diaphysis just distal to the neck. About the eighth month, bony extensions from the head and the trochanter major unite over the proximal end of the diaphysis. The proximal epiphysis, so formed, unites with the diaphysis usually during the ninth, tenth, or eleventh month, but radiographically can appear to unite as early as the sixth or seventh month.⁷ The trochanter minor also unites with the diaphysis during the ninth, tenth, or eleventh month.

The center for the distal epiphysis appears during the third or fourth week as a small, oval area at the flat distal end of the diaphysis. During the next 2 weeks, the distal surface of the diaphysis grows to resemble the occlusal surface of a quadricuspid tooth (fig. 1), and the proximal surface of the distal epiphysis becomes countermolded to fit over it. The complicated form of these surfaces accounts for the confusing shadows cast by the epiphyseal line (fig. 8-12). The distal epiphysis unites with the diaphysis during the ninth to the twelfth month.

The ossification center for the patella appears during the sixth to ninth week. Occasionally there are 2 centers, proximal and distal and, if these fail to fuse, a

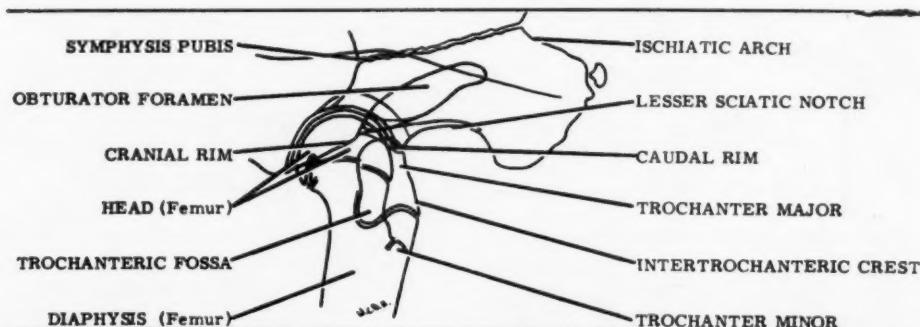




Fig. 8—Mediolateral view of the right pelvic limb of a 3½-month-old female Scotch Collie dog.

Fig. 9 (below)—Labeled tracing of figure 8.

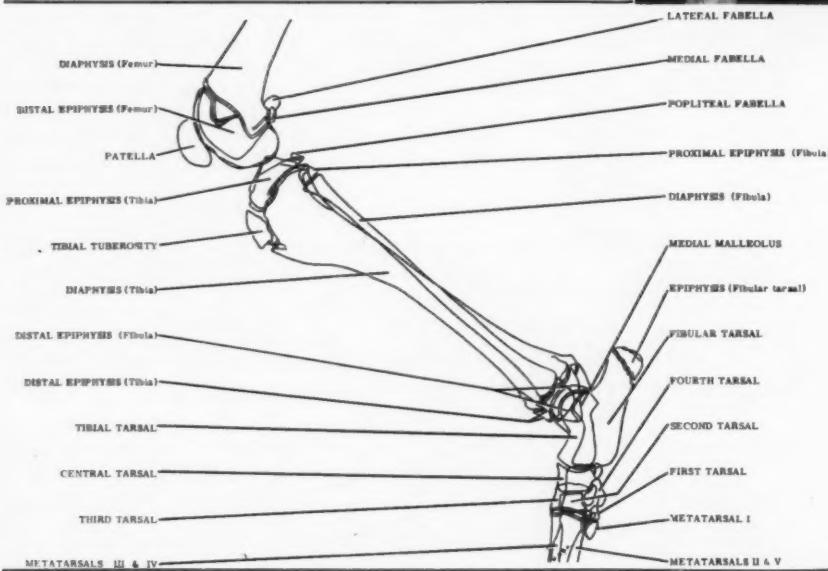




Fig. 10—Mediolateral view of the right femorotibial articulation of a 7½-month-old female German Shepherd Dog.



Fig. 11 (right)—Ventrodorsal view of the right femorotibial articulation of a 3-month-old female German Shepherd Dog.

Fig. 12 (below)—Labeled tracing of figure 11.

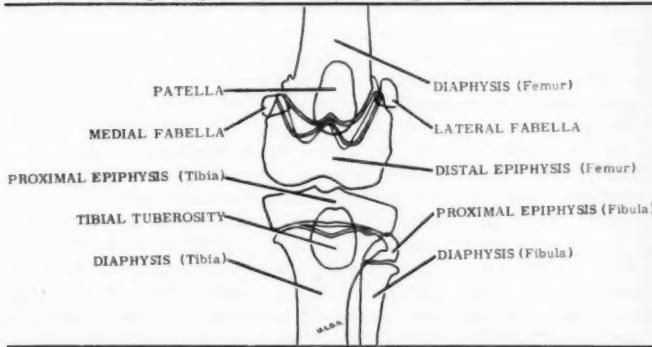
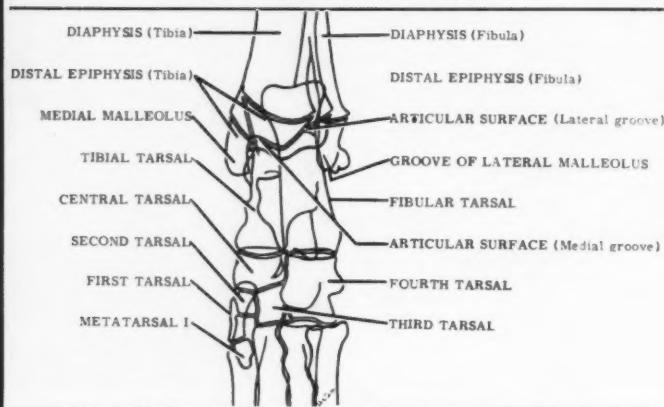




Fig. 13—Plantarodorsal view of the right tarsus and distal end of the tibia and fibula of a 6½-month-old male German Shepherd Dog.

Fig. 14—Labeled tracing of figure 13.



bipartite patella results. The single centers for the medial and lateral fabellae appear during the third month, and the one for the popliteal fabella appears during the fourth month (fig. 8, 9, 11, 12).

The tibia develops from 5 centers of ossification: 1 for the diaphysis which is ossified at birth, 1 for the condyles, 1 for the tibial tuberosity, 1 for the distal epiphysis, and 1 for the medial malleolus. The center for the condyles appears at the proximal end of the diaphysis during the second, third, or fourth week. The center for the tibial tuberosity appears dorsal to the proximal end of the diaphysis during the third month (fig. 8, 9). During the eighth or ninth month, the tibial tuberosity unites with the condyles (fig. 10), and together they unite with the diaphysis during the tenth, eleventh, or twelfth month. The center for the distal epiphysis appears during the second, third, or fourth week. Like the distal surface of the femoral diaphysis, the distal surface of the tibial diaphysis resembles the occlusal surface of a quadricuspid tooth, which again accounts for the confusing shadows of the epiphyseal line (fig. 8, 9, 13, 14). The center for the medial malleolus appears during the third month and unites with the distal epiphysis several weeks later. The

distal epiphysis unites with the diaphysis during the ninth, tenth, or eleventh month.

The fibula develops from 3 centers of ossification: 1 for the diaphysis which is ossified at birth, and 1 each for the proximal and distal epiphyses (fig. 8, 9, 11-14). The center for the proximal epiphysis appears between 1½ and 2½ months, and unites with diaphysis during the ninth, tenth, or eleventh month. The center for distal epiphysis appears during the fourth to seventh weeks, and unites with the diaphysis during the twelfth or thirteenth month.

Each tarsal bone develops from a single center of ossification with the exception of the fibular tarsal which develops from 2 centers, 1 for the body and 1 for the epiphysis (fig. 8, 9). The centers for the tibial tarsal bone and body of the fibular tarsal are present at birth. The center for the fourth tarsal bone appears during the second or third week, and can be seen in a plantarodorsal view between the tibial tarsal and second metatarsal bones. The center for the central tarsal bone appears during the third, fourth, or fifth week, and can be seen in a plantarodorsal view between the tibial tarsal and second metatarsal bones. The centers for the remaining tarsal bones appear during the fourth to

seventh weeks. The center for the epiphysis of the fibular tarsal bone appears during the sixth to eighth weeks, and unites with the body during the sixth month.

The ossification process in the metatarsal and digital regions closely resembles that of the corresponding region of the pectoral limb. However, it usually takes place a little later. The center for the vestigial first metatarsal bone appears during the seventh, eighth, or ninth week.

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Candida albicans Infection ("Thrush") in Pigs

Eight young pigs with infection ("thrush") due to *Candida albicans* were treated with nystatin. Ten others served as controls. Four of the control group died, and all of those treated survived. However, observations on the persistence of mouth lesions and their relatively rapid disappearance over a period of 1 to 2 days in both treated and control groups at the termination of 6- to 8-day illness implied that treatment may not have been responsible for their improvement. Nystatin (tablets containing 500,000 units) dosage varied from 30,000 to 150,000 units/kg. of body weight. A comparison of weight gains in survivors showed that controls gained an average of 1.2 lb. in 6 days, while treated pigs gained only 0.91 lb. during the same period.

Clinical signs of *Candida* infection in young pigs are dullness and inappetence and occasional vomiting. Most pigs have a blackish gray or, rarely, a yellow or greenish diarrhea. Mouth lesions are present in many cases, particularly on the tongue and the posterior part of the hard palate.

Mouth lesions are characterized by creamy white or yellow-white, smooth or wrinkled, soft material overlying the mucous membrane. The tongue, pharynx, and soft and hard palates are affected in that order of frequency. The extent of this covering varies from small circular areas 2 to 5 mm. in diameter and resembling colonies of *Candida* on malt agar to areas several centimeters in extent. Lesions are found in the esophagus and stomach, also, and the stratified squamous epithelium was involved principally. Death occurs suddenly or after an illness lasting as long as 2 weeks.

Feeding of a ration to which oxytetracycline or penicillin had been added or a ration with no antibiotics at all indicated that antibiotics were not a predisposing factor to the occurrence of infection in these pigs. Three of 12 pigs given therapeutic levels of chloramphenicol were believed to have developed infections as a result of oral dosing with relatively large amounts of antibiotic which encouraged growth of yeast organisms.—*Vet. Rec.*, 72, (March 26, 1960): 237.

Cutaneous Candidiasis

in a Dog

F. KRAL, D.V.M.
J. P. USCAVAGE, PH.D.

CANDIDIASIS, caused by species of *Candida*, is an acute or subacute fungus infection in which the fungus may produce lesions in the mouth, vagina, skin, nails, bronchi, or lungs, and occasionally a septicemia, endocarditis, or meningitis.

This yeastlike fungus causing candidiasis is often isolated from stools, vaginas, and throats of apparently healthy individuals, but determination of the source of *Candida* infection is difficult. Various theories regarding increased incidence of *Candida albicans* under various circumstances have been proposed; direct enhancement of growth by prolonged or excessive administration of antibiotics; elimination of symbiotic organisms in the flora; direct avitaminosis and indirect aviteminosis due to elimination of vitamin-synthesizing organisms in the host; and lowered resistance of the host because of a complicating infection, intensive therapy, or lowered nutritional state.

Human candidiasis is primarily a cutaneous and mucous membrane infection which occasionally becomes systemic.⁶ Increased virulence associated with systemic infection is limited and dependent upon a predisposed condition in the infected individual. Candidiasis has been reported² frequently in poultry as "thrush." A condition affecting the mucous membranes of the digestive organs of poultry was reported as a *Candida* infection.^{3,4} Serious epizootics of candidiasis have been found in various species of birds, chickens, geese, turkeys, pigeons, and pheasants. It has been associated with a number of debilitating conditions by other investigators.¹

Recently, increased incidence of candidiasis has been reported in other species, manifested as stomatitis and enteritis in

cattle, and stomatitis in dogs. In all instances, excessive antibiotics administration had been considered as a predisposing factor.

Antibiotic side reactions have been reported in pigs afflicted with scouring, encephalitis, excessive thirst, and variable death loss.⁷ Upon necropsy of 1 pig in an affected drove, the cardia of the stomach was occluded by an inflammatory lesion which yielded a pure culture of *C. albicans*. Occurrence of mycotic stomatitis in pigs resulting in death has been attributed to the fungus, *Odium albicans*.⁵ This organism produced a systemic toxin in addition to local necrosis.

Human cutaneous candidiasis frequently occurs on the face, neck, genitocrural region, and perianal region.⁶ Skin lesions start as well-defined circular, red scaly areas. Often erythematous papules develop, with vesicles spreading peripherally, followed by the appearance of weeping, macerated patches. Generalized cutaneous candidiasis appears as hairless, hyperkeratotic, crusted skin lesions.

Case Report

On Aug. 13, 1957, a female Boxer, 7 years old, was brought to the University of Pennsylvania veterinary clinic. During August, 1956, the dog had developed a generalized condition consisting of high fever, loss of appetite, cough, and purulent discharge from the nose and eyes.

Penicillin, streptomycin, and tetracycline were given orally and parenterally daily for 6 weeks. Recovery followed but appetite was partly impaired and there was an increased desire for water. About 3 months later, the animal developed a skin condition which started on the neck and

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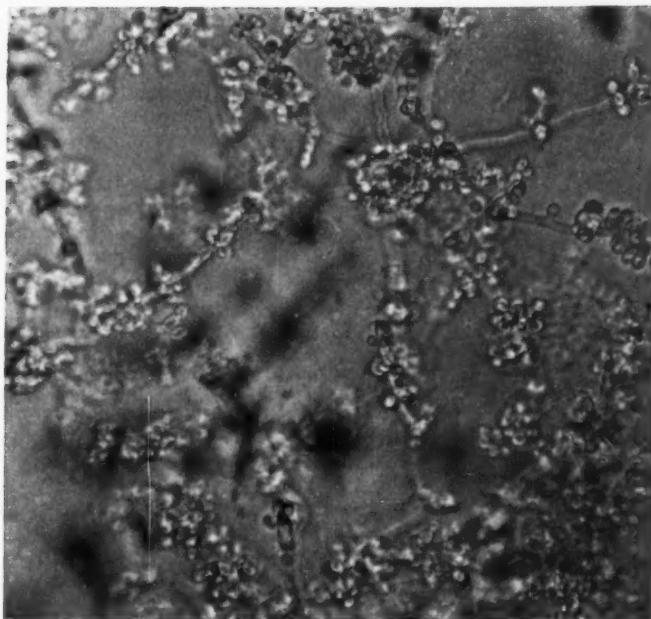


Fig. 1—*Candida albicans* pseudomycelium bearing clusters of budding and non-budding yeast cells and thick-walled, round chlamydospores. Lactophenol cotton blue mount; $\times 450$.

spread to the back and forelegs. Initially, the color of the hair in the affected areas was lighter than normal and the skin became reddish in appearance. Pustules and crusts soon developed. No pruritus was reported. The estrous cycle was normally 8 months, but estrus had not appeared during the last year. Skin lesions later spread to the back, neck, and hindlegs. These lesions were crusted, dry, and thick with folds, especially on the back.

Clinical Findings

On admission, the dog had a temperature of 101 F., pulse rate of 62, and respiration rate of 28. Its general condition was fair. All palpable lymph glands were enlarged. Visible mucous membranes were slightly pale. No changes in the oral and vaginal mucosa were observed. Examination of the respiratory and digestive organs and the nervous system revealed no deviation from normal. Hemoglobin value was 13.4 Gm./100 cc. The erythrocyte count was 5,946,000, and the leukocyte count 14,400. In a differential count, there were 87 segmented neutrophils, 2 eosinophils, 8

lymphocytes, and 3 monocytes. Urine specific gravity was 1.005 and urine was greenish yellow in color. The pH was alkaline; albumin, acetone, and sugar negative. Red blood cells, leukocytes, epithelial cells, and casts (coarse granules) were



Fig. 2—Cutaneous candidiasis of the perianal area of the dog is shown.



Fig. 3—Cutaneous candidiasis is characterized by severe hyperkeratosis of the skin which forms thick folds.

present in the urine. Nonprotein nitrogen was 32.55 per cent. No yeasts were isolated from urine and fecal cultures. No ova or parasites were observed on fecal examination.

Examination of the Skin

Skin lesions were located on the face, neck, back, perianal area, abdomen, forelegs, and hindlegs. Lesions were well defined and partially or completely hairless. The periphery of the lesions were thick and reddish. Recent lesions on the lower part of the neck and medial surface of the hindlegs were characterized by papules and pustules partially covered with crusts. Marked redness of the lesions was noticed in the perianal area. Skin lesions of the neck and back were characterized by a severe hyperkeratosis of the skin forming thick folds. No mites were found. Bacteriologic examination revealed a gram-negative rod. This rod was sensitive to erythromycin and chloramphenicol.

Mycologic Examination

A fungus was demonstrated, using 10 per cent potassium hydroxide (KOH) preparations, lactophenol cotton blue mounts, and gram-stained smears of material obtained from a lesion. Microscopically it appeared as a small, oval, thin-walled yeast cell with many buds. Some mycelial fragments were present. Cultures on Sabouraud's glucose agar and Sabouraud's glucose agar containing actidione and chloramphenical appeared as creamy, moist, or dull appearing colonies with a distinct yeasty odor.

A rapid method of identification based on morphology was performed using cornmeal agar. Organisms were selected from a Sabouraud's glucose agar plate and transferred to a corn meal agar plate. A deep cut into the agar was made, using a straight wire loop. A sterile cover slip was placed over one area of the cut. Plates were incubated at 37 F. and at room temperature. Along the cut, pseudomycelia bearing clusters of budding and nonbudding yeast cells and thick-walled, round chlamydospores appeared (fig. 1). Diagnosis of *C. albicans* was made on the basis of morphologic characteristics.

Treatment

Systemic treatment with sodium bismuth triglycollamate tablets containing 75 mg. of bismuth were given orally. During the first day, 5 tablets were given in divided doses; 4 tablets in divided doses were given the second day; 3 tablets the third day; 2 tablets the fourth day; and 1 tablet daily the following 2 days. After 9 days, the pustular lesions became dry. No new lesions formed. When the presence of *C. albicans* was confirmed, oral administration of nystatin (Mycostatin)* tablets (500,000 units) was initiated—1 tablet daily for 12 days. Nystatin ointment was applied topically for 16 days. By Oct. 12, 1959, the skin was only slightly thickened, crusts and pigmentation had disappeared. However, affected areas remained almost hairless, and the owner requested euthanasia. Postmortem diagnosis was chronic granulomatous dermatitis and chronic enteritis.

* Nystatin tablets and ointment were supplied by E. R. Squibb and Sons, New York, as Mycostatin tablets and Mycostatin ointment veterinary.

Discussion

The incidence of cutaneous candidiasis in lower animals has not been established. Nevertheless, the possibility exists that this infection is not as rare in animals as the scarcity of recorded cases indicates. Clinically, candidiasis in lower animals tends to be overlooked as a diagnosis. Since *C. albicans* is often isolated from apparently healthy individuals, it is difficult to associate the organism with the clinical condition. Repeated cultures of the lesion yielding pure cultures of *C. albicans* are the best aid in determining the presence of this etiologic agent.

Summary

A case of cutaneous candidiasis (chronic granulomatous dermatitis) in a 7-year-old female Boxer was attributed to infection by *Candida albicans*. Pure cultures were

obtained using Sabouraud's glucose agar. Bismuth and nystatin therapy were partially successful.

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Candida Mastitis Associated with Mucosal Disease in Cows

After isolation of *Streptococcus agalactiae* from a herd milk sample, the 64 cows were given intramammary treatment with penicillin. Acute mastitis developed 48 hours later in 29, with systemic disturbances in some. *Candida* sp. was isolated from milk and mammary glands. A syndrome resembling mucosal disease later developed in several cows.—*Atti Soc. Ital. Sci. vet.*, 12, (1958): 365; *abstr. 368 in Vet. Bull.*, 1960.

Persistence of BHC Residues in Milk

Lactating cows fed 1 to 125 p.p.m. BHC in their rations for 50 days excreted an almost constant amount of BHC in their milk during this period. Following termination of feeding, BHC was detectable in milk for as long as 34 days in cows fed 1 p.p.m., as long as 52 days when fed 5 p.p.m., as long as 102 days when fed 25 p.p.m., and more than 171 days when fed 125 p.p.m. A direct relationship exists between dosage of BHC and the amount which appears in milk. Gamma BHC was not detected in any of the milk samples by bioassay beyond 52 days following termination of BHC feeding.—*Ohio Agric. Exper. Sta. Bull.*, 68, (1959): 15; *abstr. 3961 in Vet. Bull.*, 29, 1959.

Embryonal Sarcoma

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IN SEPTEMBER, 1959, a domestic short-haired male cat, 8 years old and castrated, was brought to the veterinary hospital for examination because it had been losing weight.

The owner explained that, during the summer, the patient had become "somewhat thin," but this had occurred during previous summers. Appetite, bowel evacuation, urinary function, and general disposition had been normal.

Palpation revealed 2 large masses in the region of the kidney. They were freely movable, dense, and did not elicit pain on pressure. On gross examination, the urine revealed no abnormalities; it was clear, light yellow, and nonodiferous. Microscopic examination showed a few pus cells and a small amount of epithelial tissue.

Exploratory surgery was performed. The kidneys were observed to be more globular than reniform. There were several subcapsular areas of purulent material that appeared to be suspended in clear fluid. In some places, the capsule appeared to be firmly adhered. It was thickened and tough. These conditions were observed in both kidneys, which were approximately the same size.

Prognosis was not considered favorable, and the cat was euthanatized.

Pathologic Findings

The capsule was irregular and shaggy; it could not be stripped from the cortex. On cut section, the capsule was thickened,

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The author thanks A. J. Segal, M.D., of the department of pathology, St. Luke's Hospital, Cleveland, Ohio, for his assistance in pathologic analysis of the specimens.

measuring up to 0.4 cm. Just beneath the capsule, there were several cleft-like, shaggy, irregular cavities, 0.5 to 1.0 cm. in size, filled with purulent material. The cortical medullary architecture was almost completely replaced by pale reddish gray tissue, mottled with paler and softer areas that appeared necrotic. In one portion, pyramidal striae could be identified. Surrounding this area, the tissue was pale gray and homogeneous. A small pelvis was present but the calyceal system was markedly distorted.

Histopathologic Findings

Five sections on slides showed a highly cellular tumor, with necrosis. The majority of cells composing the tumor were spindle-shaped, with hyperchromatic nuclei. The nuclei varied considerably in size, shape, and staining qualities. Many mitotic figures were seen. Development of tubules and glomeruli was irregular and primitive. The most marked characteristic of the section seemed to be the tremendous amount of necrosis.

The condition was diagnosed as an embryonal sarcoma. It has been reported in dogs, swine, and chickens, but is not known to have been reported previously in the cat.¹⁻³

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Factors Influencing Immunity in

Hog Cholera Vaccination

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POSTVACCINATION problems in hog cholera immunization became evident almost immediately following the development of a means of vaccinating swine against hog cholera, and have continued to plague the swine industry every since. As early as 1916, hog cholera epizootics have been reported in several herds that had been vaccinated with serum and virus.¹⁵

In 1923, an extensive study of some of these problems was made and tests were conducted on the blood of 200 pigs which had been vaccinated 4 to 40 days prior to reported "serum" and "virus" breaks.¹ In 1931 and 1937, another investigator discussed clinical observations and postvaccination problems.^{8,9} Throughout these earlier reports, the factors of complicating infections, parasites, inferior products, and improper techniques were mentioned as possible contributors to losses following vaccination.

Within recent years, there have been several reports, substantiated by adequate experimental data^{3-6,13} showing a number of postvaccination difficulties to be due to variant strains of viruses that were immunologically different from strains used for production of hog cholera vaccines and antiserums. Undoubtedly, several of the problems encountered may be explained in this manner. However, there are still many

situations where variant strains do not seem to be a factor. Inoculation studies from several herds with postvaccinal losses failed to reveal variant viruses in any of the herds tested.¹¹ Conclusions from this study were: "Many of the postvaccinal losses are probably due to combinations of factors which (a) prevent development of an adequate immunity following inoculation or (b) cause deterioration of such active immunity later."

Very little experimental consideration has been given to these 2 probabilities in hog cholera immunization studies. Following the reports of several investigators regarding the importance of protein in development of immunity,^{2,14} a study was made of the effect of low protein ration on development of immunity to hog cholera.^{7,12} Results were somewhat erratic, but there appeared to be a definite increase in susceptibility to challenge when pigs were grossly deprived of protein in the ration. Other nutrients were deficient as well and may have been involved in the failure to establish solid immunity.

Numerous investigators have reported the presence of bacterial infections in the blood and internal organs of swine following postvaccination "breaks," but these were generally regarded as secondary invaders which lowered resistance and contributed to the failure of pigs to withstand the reaction to vaccination.

An apparent symbiotic action between *Salmonella choleraesuis* and hog cholera virus was reported by investigators studying routes of transmission of hog cholera.¹⁰ By simultaneously exposing swine to an innocuous dose of *S. choleraesuis* and hog cholera virus *per os* and on the unbroken skin, hog cholera developed more readily than when virus was given alone.

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Materials and Methods

In an effort to clarify the role of protein in immunity and to study the possible symbiotic action of *S. choleraesuis* in epizootics of hog cholera in vaccinated herds, experiments were set up to challenge the immunity of pigs vaccinated with 2 of the more frequently used hog cholera vaccines.

In the first series of tests, 18 gilts were bred and placed on 2 separate rations. Half of the gilts were put in a drylot and fed a ration of 95 parts ground yellow corn and 5 parts linseed oil meal, plus access to a mineral mixture of equal parts steamed bone meal, ground limestone, and salt. These gilts were kept on this ration throughout gestation and lactation. The other 9 gilts were placed on a properly balanced ration and had access to bluegrass. These gilts were kept on this ration throughout gestation and lactation.

At weaning time (6 weeks), all pigs from the sows in the drylot (drylot pigs) were placed on a diet of ground corn alone but still had access to the mineral mixture. The pigs from the sows on pasture (pasture pigs) remained on the balanced ration and in the same pasture after weaning. Approximately 2 weeks after weaning, all pigs were vaccinated against hog cholera. Half of the drylot pigs on the deficient ration were vaccinated with 2 ml. of vaccine A (a commercial vaccine of rabbit origin) plus 15 ml. of antiserum. The other half were vaccinated with 2 ml. of vaccine B (a commercial vaccine of swine origin) plus 15 ml. of antiserum. The same procedure was followed with the pasture pigs. Four drylot pigs and 4 pasture pigs were isolated and not vaccinated. At the end of 3 weeks, they were placed back in their respective lots to serve as controls.

Three weeks after vaccination, the drylot pigs were moved to pasture and placed on a balanced growing ration. At that time, many of them were in an extremely emaciated condition and without a change would not have survived much longer. Seventy-five days after vaccination, half of the pigs in each lot which had received vaccine A and antiserum and half of the pigs which had received vaccine B and antiserum were challenged with live virus by injecting 1 ml. of a virulent virus intramuscularly. The virus used in this and succeeding tests was obtained fresh frozen from the USDA Hog Cholera Research Station at Ames, Iowa. Daily observations and temperature recordings were made on the pigs for 14 days after inoculation with virus. The immunity of the remaining pigs in this series was challenged similarly at 145 days after vaccination to determine if there was a possible deterioration in immunity in relation to time.

The pigs used in the second series of tests had been used on another project 45 days earlier, involving exposure to *S. choleraesuis*, but they had made an apparent clinical recovery. These pigs had been confined to concrete-floored buildings since birth and were maintained on a complete ration throughout the experiment. At 45 days of age, they were weaned and vaccinated against hog cholera

with 2 ml. of vaccine B plus 15 ml. of antiserum. Two weeks following hog cholera immunization, they were given 2 ml. of an avirulent swine erysipelas vaccine.

Approximately 90 days after vaccination, 12 of these pigs were allotted to 3 isolation pens of 4 pigs each. The pigs were allotted on the basis of previous history of exposure and treatment to *S. choleraesuis*, so that each pig had a comparative equal in both of the other pens. Pigs in pen 1 were exposed orally to 0.3 ml. of a broth culture of *S. choleraesuis* alone. Pigs in pen 2 were exposed to the same dosage orally plus an intramuscular inoculation of 1 ml. of virulent hog cholera virus. Pigs in pen 3 were inoculated with 1 ml. of virulent hog cholera virus alone.

The *Salmonella* cultures used were obtained by making broth subcultures from the lyophilized culture of *S. choleraesuis* secured from the USDA Animal Disease Station at Beltsville, Md., and was designated as culture 5812 L. The hog cholera virus used in this test was of the same quality and serial number as used in the first series of tests.

Following exposure, observations and temperature recordings were made daily for 14 days. A hog cholera-susceptible pig was used to determine the presence of virus in the filtrate of pooled blood from those showing clinical signs of hog cholera. Blood was withdrawn on the sixth day after challenge and filtered through a Seitz No. 6 type EK filter. Gross pathologic, histopathologic, and bacteriologic studies were made on pigs that died and were recorded.

Results

Following challenge of immunity of pigs in the first series of tests at 75 days after vaccination, a severe reaction developed in the drylot pigs (table 1). Of the 29 pigs in these groups, 16 developed a temperature of 105 F. or higher starting on the third day after challenge. Scouring, weakness, and anorexia were common clinical signs, and 7 of the pigs died; all had typical lesions of hog cholera. Of the 16 with temperatures of 105 F. or higher, 7 had been vaccinated with vaccine A and 9 had been vaccinated with vaccine B. Of the 7 pigs that died, 1 had been vaccinated with vaccine A and 6 had been vaccinated with vaccine B.

Among 27 pasture pigs, only 3 developed temperatures of 105 F. or higher and this did not occur until the seventh day after challenge. All of the pigs continued to eat throughout the observation period, and there were no death losses.

Two drylot pigs and 1 pasture pig which had not been vaccinated served as controls.

TABLE 1 — Pigs Challenged with Hog Cholera Virus 75 Days After Vaccination

Group	No. of pigs	Pigs with temp. 105 F. or higher		Pigs died	
		(No.)	(%)	(No.)	(%)
Drylot, vaccine A	14	7	50.0	1	7.1
Drylot, vaccine B	15	9	60.0	6	40.0
Pasture, vaccine A	13	0	0.0	0	0.0
Pasture, vaccine B	14	3	21.4	0	0.0
Controls	3	3	100.0	3	100.0

Their immunity was challenged at the same time as the above 2 groups. All 3 developed typical clinical signs of hog cholera and died.

In the challenge of immunity of pigs in this series at 145 days after vaccination, the drylot pigs had a much more severe reaction than the pasture groups (table 2).

TABLE 2 — Pigs Challenged with Hog Cholera Virus 145 Days After Vaccination

Group	No. of pigs	Pigs with temp. of 105 F. or higher		Pigs died	
		(No.)	(%)	(No.)	(%)
Drylot, vaccine A	15	2	13.3	1	6.6
Drylot, vaccine B	13	5	38.4	5	38.4
Pasture, vaccine A	13	1	7.7	0	0.0
Pasture, vaccine B	12	1	8.3	0	0.0
Controls	4	4	100.0	4	100.0

Of a total of 28 drylot pigs, 7 developed temperatures of 105 F. or higher and 6 died with clinical signs and lesions of hog cholera. Among the pigs that had temperatures of 105 F. or higher, 2 had been vaccinated with vaccine A and 5 had been vaccinated with vaccine B. Of those that died, 1 had been vaccinated with vaccine A and 5 had been vaccinated with vaccine B.

In the pasture groups, only 2 pigs developed temperatures of 105 F. and these were only temporary. No other clinical signs of illness were observed. One of these pigs had been vaccinated with vaccine A and the other with vaccine B.

Four nonvaccinated controls challenged at the same time developed typical clinical signs of hog cholera and died within the 14-day observation period. Lesions ob-

served on postmortem examination were those commonly described for hog cholera.

Bacteriologic examination of tissues of pigs that died during the second challenge revealed the presence of *Salmonella* sp. in 1 out of 6 pigs, but these organisms were H₂S negative and were not regarded as pathogenic.

In the second series of tests, when *S. choleraesuis* was used as a complicating infection at time of challenge with hog cholera virus, a definite pattern was established (table 3). There were no adverse

TABLE 3 — The Effect of Inoculating Hog Cholera-Vaccinated Swine with *Salmonella choleraesuis* at Time of Challenge with Hog Cholera Virus

Pen No.	No. pigs	Inoculum	No. pigs with temp. of 105 F.		No. pigs died
			105 F.	105 F.	
1	4	0.3 ml. <i>S. choleraesuis</i> alone	0	0	0
	4	0.3 ml. <i>S. choleraesuis</i> plus 1 ml. hog cholera virus.	3	3	
	4	1 ml. hog cholera virus only	0	0	
	1	filtered blood from pigs that died in pen 2	1	1	
Control					

reactions observed in pigs in pens 1 and 3 and their temperatures remained normal, whereas 3 of 4 pigs in pen 2 had an elevated temperature the second and third days after they were given doses of *S. choleraesuis* and injected with hog cholera virus. The 3 affected pigs rapidly became prostrate and died on the tenth, eleventh, and twelfth days, respectively, following inoculation. Lesions observed on necropsy were those commonly described for hog cholera. *Salmonella* were cultured from the tissues of 2 of the 3 pigs. The fourth pig in pen 2 had no temperature rise or other abnormal reaction through the 14-day observation period.

A hog cholera-susceptible pig which was inoculated with filtered blood from the sick pigs had an increase in temperature the third day after inoculation and maintained a high temperature until its death 11 days later. Clinical signs were characteristic of hog cholera and lesions observed on postmortem examination were those commonly ascribed to hog cholera.

Discussion

At time of challenge, reactions and death losses seen in pigs that were maintained on a protein-deficient ration when vaccinated show the importance of providing an adequate diet for pigs being immunized against hog cholera. However, since many of these pigs survived challenge without reaction, the indications are that the deficient diet was not the only cause of the pigs failing to develop strong immunity, but rather a circumstance contributing to or enhancing some other interference phenomenon. At the time these pigs were vaccinated, there was no clinical evidence of any infectious disease which could be correlated with the pattern of immunity. A few weeks after vaccination, several pigs in both the drylot and pasture groups developed clinical signs of atrophic rhinitis but this could not be correlated with the pigs that later failed to become solidly immune.

Results of the challenge of pigs at 145 days after vaccination apparently indicated no deterioration in immunity when compared with pigs that were challenged at 75 days. Our purpose in conducting this phase of the experiment was to determine if the low level of immunity in the drylot pigs would tend to disappear with the passage of time. Apparently this is not the case as evidenced by a slightly lower rate of loss in the second challenge as compared with the first.

There appeared to be some difference in the protective value of the 2 vaccines used in the first series of tests. Vaccine A showed some superiority over vaccine B when applied to swine on deficient rations. However, since the majority of the pigs in these groups were fully protected and this difference was not evident in the pasture groups, the results were not regarded as an indication of an inferior product.

The apparent breakdown of immunity in pigs that were simultaneously given doses of *S. choleraesuis* and hog cholera virus seems significant, not only in respect to hog cholera immunization but possibly in other diseases as well. If an infection of an entirely different nature can block or interfere with the immunity developed against an unrelated disease, perhaps the occasional failure of some of our other animal vaccines may be partially explained. However, this experiment was conducted on a limited

scale and will be repeated with a larger number of pigs.

The 4 pigs in pen 2 had experienced a previous infection with *S. choleraesuis*; however, 1 of these pigs suffered a particularly severe infection and was not given therapeutic treatment as had the others in the group. At the time of the challenge, this pig yielded not even a symbiotic action of *S. choleraesuis*. This may be the result of his greater struggle for recovery from the previous infection.

The amount of Salmonella culture used in conjunction with virus in this experiment was comparable to infective doses used in other unrelated experiments wherein clinical cases of *Salmonella enteritis* were produced. As evidenced by a lack of any reaction among pigs in pen 1, this amount was considered to represent an innocuous dose in this experiment.

Summary

Two series of tests were conducted on swine that had been vaccinated with a hog cholera vaccine either of swine origin or of rabbit origin. Pigs that were maintained on a protein-deficient ration at the time of vaccination showed a severe reaction, with several death losses, when challenged with live hog cholera virus at 75 and 145 days after vaccination. Swine fed a balanced ration at time of vaccination survived challenge with very little reaction and no death losses. Reactions and death losses were greater in groups that had been vaccinated with a commercial vaccine of swine origin, but these results were not regarded as an indication of an inferior product.

Salmonella choleraesuis and hog cholera virus, given simultaneously, caused the death of 3 out of 4 pigs which had previously been vaccinated with a vaccine of swine origin while being fed a balanced ration. Filtered blood from the pigs that died caused typical clinical signs and lesions of hog cholera when injected into a susceptible pig.

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Strongyloides Larvae May Transmit Cholera

Hog cholera was not transmitted to young pigs fed larvae developing from ascaris eggs, which were taken from worms of pigs with cholera, or when homogenates of the ascaris eggs were injected subcutaneously. Infection did occur in a few instances when invasive *Strongyloides papillosus* larvae, together with urine or blood containing a high concentration of cholera virus, were applied to healthy, undamaged skin.—*Bull. Acad. polon. Ser. Sci. biol.*, 7, (1959): 143; abstr. 419 in *Vet. Bull.*, 1960.

Calcium-Phosphorus Ratio Influences "Bent Leg" in Goats

A disease condition known as "bent leg" in sheep has been found in young male Saanen goats in Australia, also. Deformities take the form of either an outward (bowie) or inward (knock-knee) curve of the forelimbs and are first noticeable when the goat is about 4 months old. Some goats are permanently deformed while others recover within a relatively short time.

Pathologic changes occur in the epiphyseal region of long bones, especially the distal extremity of the radius. There are changes in the endochondral ossification processes in this region.

An experiment was undertaken to study the effect of varying the calcium and phosphorus ratio in the diet of 2 groups of male kids. It was found that the group fed a ration with a calcium-phosphorus ratio in excess of 1.8:1.0 developed a high incidence of bent leg. In the other group, fed a ratio of less than 1.4:1.0, there were no bent leg cases. It was concluded that the calcium-phosphorus ratio is an etiologic factor in bent leg in goats.—*Austral. Vet. J.*, 35, (1959): 524.

Observations on the Life Cycle and Pathogenicity of the

Swine Kidney Worm

(*Stephanurus dentatus*)

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INFECTION with the swine kidney worm (*Stephanurus dentatus*) has been found to be an important factor in the economy of swine production in enzootic areas. Losses attributable to the parasite are deaths from gross parasitism, retarded growth, increased amount of feed necessary, and lowered market prices based on expected condemnation of edible parts.

Pigs experimentally infected with kidney worms grew 0.5 lb. less per day than non-infected controls, required 404 lb. more feed, and reached market weight 59 days later.²

Reports on incidence in farm-raised swine from the southern regions of the United States ranged up to 94 per cent.⁷ In one report, the greatest monthly percentage of condemnation (84%) of livers from parasitic damage occurred in November and the least (38.9%) in May.³

Estimates place losses attributable to swine kidney worms from condemnation of edible portions of carcasses alone at 60.5 cents per hog.³ In 1957, there were 752,000 hogs slaughtered in North Carolina,¹⁰ with an estimated loss of \$454,960 due to condemnation of edible portions because of kidney worm lesions.

The swine kidney worm has a wide geographical distribution in tropical and subtropical regions. It has been reported in Australia, the Philippines, Hawaii, West-

ern Indies, Central and South America, Indo-China, and South Africa.

In the United States, this parasite is most prevalent in the South Atlantic and South-Central States. Recently it has been observed that kidney worms have spread to other sections of the country. The parasite has been reported in swine originating from California, Washington, Illinois, Minnesota, Missouri, Kansas, Nebraska, New Jersey, Connecticut, and Massachusetts.^{1,15}

The swine kidney worm was described and named *Stephanurus dentatus* in 1839.⁵ It was discovered in 1835 in Brazil in mesenteric cysts of a Chinese pig.⁶ In 1858, it was recovered from the perirenal fat of pigs in the United States.¹⁶ Several excellent reviews of the literature have been published showing synonymy and detailed description of morphology.^{4,5,9,12,13}

Studies on Ova and Larvae

Sows having a high concentration of ova in the urine were obtained from a local abattoir and moved to isolated quonset huts with concrete floors. These were cleaned daily.

In checking sows for daily output of swine kidney worm ova, it was found that the first third of the urine passed at each urination was practically void of ova and that the majority of ova were present in the terminal urine.

Urine from infected sows was collected during urination and filtered through No. 4 filter paper with the aid of a vacuum trap. The filter papers with collected eggs were placed in Petri dishes and covered with tap water. To each dish was added 30-mesh cocoanut charcoal. Ova adhered to glass containers after pouring off urine. This adherence was probably due to the mucoid character of the urine commonly associated with swine kidney worm infection.

Studies were made of the influence of various temperatures on the percentage of ova hatched and the time required for hatching. It was found that the optimum temperature was 27.5 C. At higher

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temperatures, the incubation period was shortened, but the percentage of hatch was decreased, with no hatching above 37.5 C. Below 27.5 C., the incubation period was lengthened and the percentage of hatch decreased. According to these tests, 16.0 C. appears to be the minimum temperature at which hatching occurs.

Ova exposed to morning sun, afternoon sun, or both indoors at 27.5 C. hatched in 24 hours. Ova exposed to the sun outdoors at 32.0 C. failed to hatch.

Glass with adhering ova was placed in a moisture-saturated atmosphere at 27.5 C., so that a film of moisture collected on the glass. The ova hatched in 24 hours. In other trials, regardless of the relative humidity of the atmosphere, a film of moisture was necessary for hatching of ova.

In a preliminary trial to determine the effectiveness of the Baermann apparatus in recovering *S. dentatus* larvae and to determine vertical migration distances, urine from infected sows was poured on 1-foot square grassy plots. Larvae recovered from the plots 2 through 3 weeks later represented 6 to 10 per cent of the total number of eggs deposited with the urine. From samples taken at different vertical levels of the ground and grass, it was found that most of the larvae were located at the ground surface; none were recovered above the first inch of grass or below ground level.

Earthworm Studies

It has been demonstrated experimentally that the earthworm (*Eisenia foetida*) can serve as a transport host for *Stephanurus dentatus*. Presence of ensheathed larvae in "brown bodies" (masses of amoebocytes) can be demonstrated as early as 4 days after exposure to infective larvae. Also, exsheathed larvae were demonstrated in the lumen of the gut.¹⁵

In these studies, earthworms were kept in large staining dishes containing sterile soil to which water-charcoal cultures of infective larvae were added. Thirty-three earthworms were examined at various intervals after initial exposure, and 18 were found to contain either exsheathed or ensheathed larvae in the gut or in brown bodies. The larvae in the brown bodies were ensheathed, inactive, but viable, while those in the gut were usually exsheathed and very active. The larvae lose their sheaths in the gut and, if they penetrate the gut, are incorporated into brown bodies, presumably forming another sheath without undergoing morphologic change.

Known numbers of infective larvae in water were given to anesthetized earthworms. The larvae were deposited in the gut just below the pharynx by means of a blunt 20-gauge hypodermic needle. Of 18 worms, 5 were positive for larvae 1, 7, or 9 days after exposure. The larvae were exsheathed in the gut during the first day. Larvae found 7 or 9 days after exposure were present only in brown bodies.

Examination of castings of an earthworm day after inoculation of approximately 30 larvae revealed presence of 3 larvae, 2 of which were dead and the other alive and ensheathed. No larvae were found in the earthworm. Further studies on the fate of the larvae within the earthworm are contemplated.

No earthworm collected from areas known to be contaminated with *S. dentatus* eggs has been found to be naturally infected.

Longevity of Adult Worms

A Berkshire sow was purchased from a local abattoir, following demonstration of kidney worm ova in the urine, and placed in a quonset hut. The concrete floor was scrubbed daily to prevent reinfection. This sow served as a source of ova and larvae, as each urination examined contained in excess of 300,000 ova.

For 24 months, the urine of this sow was checked for ova content. There was no decrease in ova production for 23 months. At the end of the 24th month, ova production had decreased slightly, with a sharp drop in percentage of hatchability. Observations on this sow indicate that the adult parasite has a longevity in excess of 24 months.

Experimental Work with Swine

A group of 40 pigs were obtained from a herd known to be free of swine kidney worms. The pigs were moved to a quonset hut and placed on concrete floors when 8 weeks old. After vaccination against hog cholera, they were randomly allotted to 4 groups of 10 each.

Group 1.—Pigs were anesthetized and 50 cc. of a suspension of previously boiled hog feces containing 1,000 larvae was placed on the unclipped abdomen for one hour. At the end of the hour, the suspension was removed by washing and all animals in the group were thoroughly washed to remove extraneous larvae. The procedure of inoculating and washing was repeated for 6 consecutive weeks.

Group 2.—Pigs were given 15 earthworms at weekly intervals for 6 weeks. Each worm had been exposed to 1,000 larvae in small glass dishes. The earthworms were minced with scissors and given orally in a water suspension.

Group 3.—Pigs were given a total of 1,150 larvae orally in a water suspension over a 6-week period in consecutive weekly doses of 300, 200, 200, 100, 150, and 200.

Group 4.—Pigs in this group served as controls.

A postmortem examination was made of pigs from each group at intervals from 7 to 64 weeks after the first inoculation. Detailed examinations, gross and microscopic, were made of organs to determine the presence of worms and the histologic changes produced.

Pigs of group 1, exposed to 1,000 larvae on the skin for 6 weekly intervals, had lesions in the liver, indicative of kidney worms, up to 21 weeks after inoculation. After 27 weeks, no lesions were observed

in the liver. The liver, lungs, kidneys, and perirenal fat of pigs necropsied at 7 and 9 weeks after inoculation were ground and placed in Ringer's solution. After incubation at 37 C. for 24 hours, examination for larvae was made. No larvae were demonstrated in any pig of this group and no eggs were passed in the urine.

The infected earthworms established infections in 5 of the 10 pigs when administered at 6 weekly intervals. Ova were demonstrated in the urine of a gilt 9 months after the earthworms were given to the gilts. Immature worms were demonstrated in the liver 49 days after the earthworms were given to the gilts.

Oral inoculation with repeated doses of infective larvae resulted in an infection of 7 of 10 pigs. One gilt had ova in the urine 16 months after the inoculation. The liver of a pig necropsied 9 months after inoculation had 10 parasites. Three parasites were encapsulated in liver parenchyma. One parasite protruded partially through the capsule of the liver. The remainder of the parasites were in the dorsal third of the liver, just under the capsule.

None of the control pigs showed lesions indicative of kidney worm infection.

Parasite-Free Pigs

A sow known to be free from kidney worms was placed in an air-locked, entrance-type isolation unit and dewormed weekly for 6 weeks with a piperazine anthelmintic. During estrus, she was moved in a clean truck to a scrubbed concrete floor to be bred. Upon her return to the unit, she was scrubbed thoroughly. Beginning a month after breeding, she was again given a piperazine anthelmintic for 3 weekly treatments. At the end of the third month of pregnancy, feces were found to be free of parasite ova.

The pigs, at 6 weeks of age, were moved to other isolation units after feces were shown to be free of parasite ova. Pigs from one group were inoculated with 10,000 infective larvae orally, and pigs in another group served as controls.

Blood samples were collected at weekly intervals for blood chemistry and cytologic studies. Eosinophilia was present from the second to fourth week after inoculation and reached peak values of 33 to 34 per cent after 3 weeks.

Serum chlorides from infected and control pigs in this trial failed to show significant changes.¹¹

Kidney Worm Infection in Calves

The danger inherent in allowing cattle and swine to occupy the same pastures is emphasized by the pathologic changes produced when cattle are given infective swine kidney worm larvae.

A total of 8 calves, at least 2 months old, were inoculated orally with 15,000 to 100,000 infective larvae. Postmortem examinations were made from 1½ to 10 months postinoculation.

The outstanding lesions in calves during the first 4 months of infection were confined to the liver and pancreas. The liver had numerous whitish to tan focal areas on the surface and throughout the parenchyma. Extensive caseous and fibrotic areas were present. The pancreas showed an extensive area of fibrosis.

An inoculation dose of 55,000 larvae was fatal to a 10-month-old calf within 42 days. Another calf given 30,000 larvae when 2 months old became comatose 2 months postinoculation.

A calf given 55,000 larvae when 9 months old was necropsied 5 months after inoculation. Seven kidney worms were found in the suprahepatic tissue.

None of the calves examined had ova in urine, nor could parasites be found in the vicinity of the ureters.

Gross lesions, following orally induced infections of 1 to 2 months' duration, were most prominent in the liver. Pigs given 15,000 larvae showed acute verminous hepatic cirrhosis, chronic pneumonia with subpleural hemorrhages, mesenteric lymphaden hypertrophy, and whitish focal surface lesions on the kidneys. Pigs infected with graded doses between 15,000 and 20,000 larvae showed lesions proportional to the size of the infective dose.

Calves, 2 to 3 months after oral doses of 30,000 larvae, showed hepatopathy similar to that seen in the pigs described. The hepatic nodules were numerous, the purulent centers of which contained immature *S. dentatus* in many instances. Experimentally induced stephanuriasis in cattle produced the characteristic gross pathologic pattern of the disease as it occurs in pigs.

Histopathologic Findings

Liver sections from pigs given 2,000 *S. dentatus* larvae and necropsied 44 days later showed a moderate leukocytic infiltration (principally eosinophils) in the interlobular connective tissues. The leukocytic infiltration appeared more marked in areas around the hepatic trinity. Focal areas of necrosis, cirrhotic areas, and proliferation of interlobular connective tissue were observed. The necrosis initially was centrilobular.

In liver sections of pigs given oral doses of 7,000 and 10,000 infective *S. dentatus* larvae, the histopathologic changes listed above were relatively more marked and extensive. Little normal functioning tissue was present in sections examined from the pig given the dose of 10,000.

Sections of kidneys of the infected pigs showed loss of tubular epithelium in the upper nephron, many atrophic glomeruli, small areas of leukocytic infiltration, and moderate hyperplasia of elastic fibers.

When the infective dose was large, parasites invaded the pancreas and became encysted in necrotic verminous abscesses. The pancreatic glandular acini adjacent to the parasites showed cloudy swelling and fatty degeneration. Eosinophils were prominent in the extensive leukocytic infiltration, and the islets of Langerhans showed hyperchromatic staining. Proliferated connective tissue was abundant around the verminous abscesses.

Summary

1) Swine may become infected with *Stephanurus dentatus* by 3 avenues: (1) ingestion of infective larvae, (2) penetration of unbroken skin, and (3) by access to infected earthworms serving as transport hosts.

2) Regardless of avenue of infection, the immature worm spends 4 to 9 months in the liver. Those not trapped by encapsulating tissue migrate to regions in the vicinity of the ureters.

3) The long life span of this parasite is indicated by requiring 9 to 16 months to reach patency, with infection persisting in a sow for at least 24 months.

4) Infection in swine and calves results in verminous hepatic and pancreatic ab-

cesses, extensive fibrosis, and marked eosinophilia.

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"Red Spot" in Poultry

Morris S. COVER, V.M.D.

RECENTLY, there has been considerable interest in a condition of young chickens, particularly broilers, which has been named "red spot." This name was used because of the presence of red dots on the small intestine. According to reports received at the University of Delaware, this condition is occurring with increasing frequency. Due to widespread interest in this condition, we have undertaken a study to ascertain the cause, and thereby be able to recommend a control program to alleviate the concern of the poultry industry. The results of our study are reported below.

Description of Condition

Red spot is characterized externally by definite bleaching of the shank and beak. In most cases, this paleness is accompanied by lack of vigor and depression. Occasionally, diarrhea is present. One of the outstanding characteristics of this condition is the reduced weight gain and poor feed conversion. The principal lesion which characterizes it is the presence of small red dots on the small intestine. Critical observations will reveal small white dots also. These dots are small, being about the size of the head of a pin. They are plainly visible in the wall of the intestine when observed from the outer surface (peritoneal surface). They may or may not be visible from the inner surface of the intestine. In some birds, the internal surface (mucous membrane) of the intestine appears thickened, whereas in others there is a slight ballooning of various portions of the small intestine.

Experimental Procedure

In order to make accurate diagnoses, the following procedure was established. At

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least 3 birds were examined from each suspected flock. The flocks used were chosen by field servicemen who encountered the disease. Each suspected bird was carefully examined by routine necropsy procedures. In each of the 12 flocks examined, 2 or more birds had red and white dots on the small intestine.

Scrapings of the intestinal mucosa (jejunum) were made from each chicken. Direct smears were made from only a few birds which were chosen at random. Only occasionally did the direct smears show the presence of coccidial oocysts. Sugar floatations were made of each mucosal scraping. The cecal contents were also examined by the flotation method. Coccidial oocysts were found in scrapings in almost every instance.

In addition to the above laboratory procedures, histologic sections were prepared from the small intestine of each chicken. A study of these sections indicated that a coccidial infection was present in almost every intestine.

Our examinations of these birds was thorough and no other infectious disease condition was observed. Therefore, it is our opinion that the condition known as "red spot" is coccidiosis and should be so termed. The introduction of general names such as red spot for disease conditions only confuses the issue.

Our experimental work did not include the identification of coccidial species. In our opinion, however, *Eimeria necatrix*, *Eimeria maxima* and *Eimeria acervulina* were involved. Other species may have been present in some cases.

Many of the field cases of red spot have been treated with such medicaments as sulfamethazine, sulfaquinoxaline, and other sulfonamides. Often, there was definite improvement in the condition following treatment.

One word of caution should be included at this point. The presence of large red blotches, usually angular in shape, on the

small intestine, are not indicative of coccidiosis. Such red to pink areas can be found in apparently normal chickens. The exact nature of these blotches is not known. They should not be confused with the small red dots of coccidiosis.

Summary

It is our opinion that the disease "red spot" as we have seen it is a mild case of coccidiosis (not cecal type). Red and white

dots on the small intestine are typical lesions. Occasional ballooning of the intestine, thickening of the mucous membrane, or both are also lesions which have been associated with coccidiosis. This diagnosis has been confirmed by the finding of oocysts in the intestinal contents, by the flotation method, and by finding typical histopathologic changes in the intestinal wall. We recommend that chickens so infected be treated with accepted anticoccidial medications.

New Duck Syndrome

The "new duck syndrome" is one of the significant new diseases in the duck industry. Typical signs are incoordination, head tremors, dorsal recumbency, and paddling. Most ducks show varying degrees of respiratory distress as well as diarrhea.

Postmortem examination reveals fibrinous deposits in the air sacs and on the surface of the liver, fibrinous pericarditis, peritonitis, and varying degrees of pneumonia. A fibrinous meningitis occurs frequently.

A tentative diagnosis can be made on the basis of history, clinical signs, and postmortem findings. Bacterial examinations for *Pasteurella multocida* are advisable. The etiologic agent is unknown.

Sulfaquinoxaline is effective therapy in some cases. Oxytetracycline in oil has shown a protective influence for about 10 days in infected ducks.

The migration of wild ducks through an area, or other vectors, may be responsible for introducing the disease.—*Anim. Dis. Trends*, 7, (1959) : 1.

Insect Control of Poisonous Plant

The cinnabar moth (*Tyria jacobaeae*) is being imported to control tansy ragwort, a plant poisonous to horses (and, to a lesser extent, cattle) in the coastal areas of California, Oregon, and Washington. Presumably, the moth will attack no useful plant.

The aggressiveness of the plant is due in part to lack of natural competition. If the moth responds favorably to the climate in the release area, it is anticipated that it will control the weed sufficiently to permit range grasses to grow into the cleared areas, thus effecting lasting control.—*Agric. Res.*, Jan., 1960.

Editorial

What, No Hospitality?

The death knell has sounded for the so-called "hospitality suite," long considered a convention-related institution by some but labeled a distinct evil by others.

The Definition

In operation, hospitality suites are typically rooms, or suites of rooms, in the hotels housing veterinary conventions. Operated by commercial exhibitors and manned by their sales and professional personnel, these rooms provide a means by which manufacturers or distributors host their customers. Liquid refreshments are provided without limit. Food and professional entertainment are sometimes offered; occasionally, the suite takes on the proportions of a hall and the festivities expand proportionately.

Those Favoring

Those who favor the hospitality suite feel that this is one of the best places to find and to visit old acquaintances. Further, they feel that if they've purchased supplies all year from a distributor, there's certainly no harm in absorbing a few dollars worth of hospitality in return. A few might hope to discuss with the company representatives the merits or limitations of the company's products. A few affluent sponsors might prefer to retain the custom because they are in a position to put on a better show than most of their competitors.

Those Against

Those who view the hospitality suite with disfavor seem to be more numerous than the aforesaid proponents. Some feel that the suites compete with official convention activities and point out that several states have ruled against them. The conventioneers who have ever had a hotel room within earshot of a noisy, night-long hospitality suite are in favor of eliminating them. The company representatives as-

signed to the suites from early evening until early morning (often after having manned an exhibit booth all day) look forward to more sleep. Some company officials say they spend hundreds or even thousands of dollars on their suites at the large meetings, but feel that it's poorly spent. The veterinarians who take their families to conventions (almost half took families to the Kansas City AVMA Convention) favor elimination of hospitality suites, hoping for less exposure of the children to inebriation. Abstainers hope that some of the heavy (and even moderate) imbibing will be discouraged.

Outlawing the hospitality suite has been discussed on several occasions by the AVMA Board of Governors. In November, 1959, the matter was discussed by representatives attending the First Annual Conference of AVMA Constituent Association Secretaries, and the consensus favored abolishing hospitality suites. At that meeting, a spokesman for the American Veterinary Exhibitors Association said this organization favored outlawing the hospitality suite.

The Decision

At its meeting immediately following the Kansas City convention and again in March, 1960, the AVMA Executive Board, fulfilling its responsibility for convention planning, studied plans for the convention to be held in Denver. Among other things, the Board directed that the AVMA staff take the necessary administrative steps to abolish hospitality suites. As a result, the rules and regulations for exhibits now contain this paragraph: "Entertainment and Hospitality Suites—The use of hotel facilities by exhibitors for entertainment purposes, including hospitality suites, will not be allowed." Not explicit enough, perhaps, but exhibitors are expected to abide by the spirit of the rule. They are not likely to risk jeopardizing their standing as AVMA convention exhibitors, and are no doubt happy to be relieved of this growing burden.

The national convention is an activity conducted for the members, the majority of whom are believed to approve abolition of the hospitality suite. Since the House of Delegates is the only authority now likely to reconsider the problem of hospitality suites, a member who feels strongly for or against it should so inform the delegate from his state or province.—D.A.P.

from the Research Journal

Survival of Foot-and-Mouth Disease Virus in Meat

Donor cattle were slaughtered 33 to 35 hours after inoculation with foot-and-mouth disease virus (FMDV), type A119, at a time when viremia was established and secondary lesions were beginning. Comparable and anatomically identified tissue samples from the infected carcasses were tested in 37 experimental groups of cattle. Samples of muscles, blood, and lymph nodes were each tested fresh, after ripening (stored 72 hr. at 4 C.), and after storage in wooden barrels at 1 C. for 16, 30, and 50 days. Each of the latter samples included barrels of cured meat (ripened and salted) and barrels of unripened, unsalted meat. Infective virus was demonstrated in all fresh samples, in ripened blood and lymph node samples, and in all cured and uncured lymph node samples, except one. Thus, salt curing did not inactivate the virus. Whole carcasses stored at 4 C. contained virus in rib bone marrow at 14, 60, and 73 days, and in lymph nodes, blood, and muscle samples at 60 days. Lactic acid for-

mation and other chemical changes that take place during ripening inactivated virus in muscle tissue. However, these changes do not appreciably affect virus in lymph nodes, large blood clots, or bone marrow.

In transverse sections of muscle from chilled carcasses, the pH readings showed a general increase in acidity from the superficial toward the deep areas, corresponding to the degree of cooling. Conditions were favorable for virus survival in superficial portions for nearly 48 hours. It was concluded that meat derived from animals infected with FMDV was not rendered free of virus by the usual commercial procedures of ripening, boning, salting, and storage, since virus could survive in certain tissues customarily included. — [G. E. Cotral, B. F. Cox, and D. E. Baldwin: *The Survival of Foot-and-Mouth Disease Virus in Cured and Uncured Meat*. *Am. J. Vet. Res.*, 21, (March, 1960): 288-297.]

Agglutination Test for Pseudotuberculosis

Pseudotuberculosis is a common disease in Sudan and most of the information on its frequency comes from meat inspection statistics. Various serologic tests were used to diagnose the disease in the living animal, but the main difficulty in perfecting these tests was the tendency of various strains of *Corynebacterium ovis* to clump. By studying the clumping rates of different strains, it was possible to find a strain suitable for preparing a bacterial suspension for the agglutina-

tion tests. This suspension was a 5 per cent salt solution containing 10 to 20 per cent heated normal rabbit serum with the pH adjusted to 6.8.

The agglutination tests were found to be specific in the diagnosis of pseudotuberculosis in sheep; the slide test was preferable to the tube test. — [F. I. Awad: *Serologic Investigation of Pseudotuberculosis in Sheep. I. Agglutination Test*. *Am. J. Vet. Res.*, 21, (March, 1960): 251-253.]

Experimental Ovine Calculosis

A pelleted ration with a high ratio of concentrate to roughage (4:1), and containing 2.5 per cent K₂HPO₄, consistently produced a high incidence of urolithiasis in yearling wethers. Occlusion at the sigmoid flexure or urethral process, with subsequent rupture of the bladder, were common findings. Oral supplementation of

acetazolamide did not decrease the incidence of urolithiasis. Urine from wethers with experimental urolithiasis exhibited aggregates of phosphatic "microcalculi" bound in organic envelopes which stained positively by the periodic acid-Schiff technique. Sheep fed the "calculi-provoking" diet excreted more sodium, phosphorous, and mucopro-

teins per day in their urine than was observed when given alfalfa hay. Serum mucoprotein levels were also increased in wethers receiving the experimental ration.—C. E.

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New Books

New and Nonofficial Drugs

This book, an annual publication of the Council on Drugs of the American Medical Association, contains descriptions of drugs evaluated on the basis of available laboratory and clinical evidence. Its scope comprises agents proposed for use in or on the human body for the diagnosis, prevention, or treatment of disease, whether or not their usefulness has been definitely established.

Descriptions are limited to individual drugs generally available in the United States that have not been included in the "Pharmacopeia of the United States" (U.S.P.), the "National Formulary" (N.F.), or "New and Nonofficial Drugs" (N.N.D.) for a prior cumulative period of 20 years.—[*New and Nonofficial Drugs*. 768 pages. J. B. Lippincott Co., Philadelphia, Pa. 1960. Price \$3.35.]

Laboratory Identification of Pathogenic Fungi Simplified

The intention of the authors in preparing this book was to provide beginning students of medical mycology and bacteriologists engaged in mycologic diagnosis with a useful aid in the identification of the common pathogenic fungi. In the opinion of this reviewer, this modest objective has been adequately met.

The pathogenic fungi described in this book are those that can be expected to be encountered in diagnostic laboratories in the United States. These organisms are covered under the general headings of "Superficial Mycoses" and "Deep-Seated Mycoses." The gross and microscopic characteristics of each pathogen are presented and the textual descriptions are adequately supplemented with black-and-white illustrations. Also the authors have included photomicrographs of the fungi in tissues. It is regrettable, however, that the authors could not have presented the photographs of the cultures in color since pigmentation of colonies is an important criterion in their recognition. In addition to the descriptions of the pathogenic fungi, the authors also define the disease each organism induces and they list specimens that are suitable for mycologic examination. A brief description of the

pathogenicity of each fungus for laboratory animals is also given.

This book also contains a section on the common laboratory fungal contaminants, wherein the textual descriptions of each saprophyte is adequately supplemented with illustrations. The authors have also included a chapter devoted to the formulas of the common mediums employed in medical mycology. In addition, a useful bibliography appears in a separate section at the end of the book.

It must be emphasized that this volume in no way can serve as a textbook on medical or veterinary mycology, nor can veterinarians or veterinary students find, in this work, information on the disease processes in human or animal hosts. Such details must be obtained from other sources. This book can only be recommended to those individuals who are interested in or have need for an illustrated aid in the identification of the common pathogenic fungi.—[*Laboratory Identification of Pathogenic Fungi Simplified*. By Elizabeth L. Hazen and Frank Curtis Reed. 2nd ed. 150 pages; illustrated. Charles C Thomas, 301-327 East Lawrence Ave., Springfield, Ill. 1960. Price \$7.50.]—WILLIAM KAPLAN.



News

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✓ **Meat Hygiene Training Center**

Digest of the AAHA Meeting in New England

The 26th annual meeting of the American Animal Hospital Association convened at the Statler Hilton Hotel in Boston, Mass., April 19-22, 1960.

Among the many events in the scientific portion of the AAHA's program were: Drs. Brian Singleton, London, England—differential diagnosis of canine stifle injuries and their treatment; William Harker Rhodes, Deal, N.J.—radiography of the abdomen; Robert E. Arline, Greenwood, Miss.—fire protection and equipment; Robert M. Schwartzman, Philadelphia, Pa.—canine dermatosis; and Clifford C. Snyder, Miami, Fla.—practical plastic surgery.

The last two days of the conference included: Drs. I. S. Ravdin, Philadelphia, Pa.—preoperative preparation; J. Raymond Currey, Washington, D.C.—you, the client, and the injured pet; J. E. Whitehead, N.Y.C., N.Y.—examination of injured dog; Carl Walter, Boston—hospital sepsis; W. H. Rhodes and W. H. Riser, the latter from Kensington, Md.—recognition and diagnosis of internal injuries; Jacob Fine (M.D.), Boston—management of shock and sepsis; L. A. Johnson, South Bend, Ind.—immediate management of bone and joint injuries; Brian Singleton and J. R. Dinsmore, the

latter from Glenview, Ill.—anesthesia; David R. Cooper (M.D.), Boston—traumatic injuries to central nervous system; George Abbott, Worcester—decompression of subdural hematoma; R. P. Knowles, Miami, Fla.—skin, muscle, and tendon injuries; John Kinney (M.D.), Boston—exploratory procedures on human beings; C. Lawrence Blakely, Boston—exploratory procedures on the dog; L. R. Barto, Basking Ridge, N.J.—nursing and ward care-first 24 hours; Anthony S. King, Philadelphia, Pa.—diseases of the vertebral column in the cat; Margaret Petrak, Boston—griseofulvin in the treatment of ringworm in cats; Jean Holzworth, Boston—disorders of old cats; and Stanley Gershoff (Ph.D.), Boston—vitamin E studies in cats.

The newly elected roster for the AAHA is: Drs. Wayne H. Riser, Kensington, Md., president; Lester R. Barto, Basking Ridge, N.J., president-elect; Robert P. Knowles, Miami, Fla., vice-president; and Ralph E. Ruggles, Moline, Ill., treasurer. Dr. Frank R. Booth, Elkhart, Ind., was employed as the Association's secretary.

Two new executive board members were also chosen: Drs. Peter S. Roy, Jacksonville, Fla., for Region 2 and Dr. Howard F. Carroll, San Francisco, Calif., for Region 5.

AAHA Honors Drs. Holzworth and Hardenbergh

Dr. Jean Holzworth Wins Gaines' "Veterinarian of Year" Award

Dr. Jean Holzworth (COR '50), of the Angell Memorial Animal Hospital, Boston, is America's "Veterinarian of the Year." She was presented with her "Fido" Award by Harry Miller, director of the Gaines Dog Research Center, N.Y., sponsor of the

Award, at the AAHA's convention in April.

Dr. Holzworth is the first woman to receive the Award, and is also the first veterinarian to win a "Fido" for work with cats, her specialty. She has studied both here and abroad, and has an M.S. as well as a Ph.D. degree. Prior to studying veterinary medicine, she taught the classics at Mt. Holyoke College, Bryn Mawr College, and the Briarly School.

"Fido" Honor for Cat Doctor



Continued from column 2 on page 631 . . .

At graduation from the New York State Veterinary College, she received the Borden Award. Since that time, she has been an interne, resident, and then staff member of the Angell Memorial Animal Hospital in Boston. She is the author of many papers on diseases of cats and is currently in the process of preparing a book on feline diseases. In addition, she travels widely as a speaker to veterinary groups.

Dr. Holzworth is a member of the Boston and Massachusetts associations and also of the AVMA, Phi Zeta, and Phi Kappa Phi.

Dr. Jean Holzworth of Angell Memorial Animal Hospital, Boston, receives the "Fido" Award from Harry Miller, director of the Gaines Dog Research Center, New York, after the awards committee of the AAHA selected her as winner of the Gaines "Veterinarian-of-the-Year" prize at a recent convention.

Dr. Holzworth is the first woman veterinarian to receive the honor, and is also the first veterinarian to win a "Fido" for work with cats.

Dr. Hardenbergh Receives Morris Animal Foundation Award

Dr. John G. Hardenbergh of Evanston, Ill., executive secretary of the AVMA from 1941-1958, was awarded the Morris Animal Foundation small animal medicine award at the American Animal Hospital Association convention in Boston, April 20, 1960.

Dr. Hardenbergh was cited for his contributions in research, in industry, in public health, and particularly for efforts toward raising the standards of the profession through organized veterinary medicine. The citation stated that Dr. Hardenbergh has

done more than any other person to organize, promote, advance, and elevate veterinary medicine to its present high plane in American society.

It was through Dr. Hardenbergh's efforts that specialty groups developed within the profession, an early one being the American Animal Hospital Association. Today, some two dozen specialty organizations exist in veterinary medicine, many of them directly under the guidance of the AVMA (see below for two other honors he received recently).

Dr. Hardenbergh Honored by Colleagues and Friends at Testimonial Dinner

Almost 19 years of dedicated service to the AVMA, 18 in the top post of executive-secretary, earned Dr. John G. Hardenbergh the respect and admiration of his colleagues throughout the veterinary medical world.

At a dinner held March 4, 1960, at Chicago's University Club, approximately 100 veterinarians, their wives, and other friends of Dr. Hardenbergh gathered to formally honor him for his contributions to the vet-

erinary profession and wish him well in his forthcoming retirement.

The highlight of the evening was Dr. Hardenbergh's address to the group. In it he told of his decision to pursue the study of veterinary medicine after starting his education in engineering. With characteristic and becoming modesty, he bestowed the credit for any achievement attributed to him on his wife, Sue, on his colleagues, and on

At right, Dr. William A. Hagan (left) is shown presenting a bound volume of letters to Dr. John G. Hardenbergh (right) from the latter's many well-wishers. Occasion of the presentation was Dr. Hardenbergh's testimonial dinner on March 4, at the Chicago University Club.



those generally unrecognized individuals who tended to the daily chores of the Association.

As a token of appreciation, Dr. Hardenbergh was presented a television set. Dr. Dan Anderson of Fort Worth, Texas, made

the presentation.

Dr. William A. Hagan of Ames, Iowa (formerly of Ithaca, N. Y.), presented a bound volume of letters of appreciation and good wishes sent to Dr. Hardenbergh on this occasion by his associates and friends.

Interprofessional Council also Honors Dr. Hardenbergh

The Distinguished Service Award of the Illinois Interprofessional Council for 1959-1960 was presented to Dr. John G. Hardenbergh on April 30, 1960, at the Swedish Club, 1258 N. LaSalle St., Chicago.

Dr. Hardenbergh's great devotion in advancing the cause of both animal and human welfare has won him the respect of all whom he encountered during his many years of dedicated service. He has a rare gift in the areas of interprofessional relations, combining consideration, modesty, and reticence, while constantly promoting just causes, with an humanitarian's approach.

Dr. Hardenbergh has a host of friends among veterinarians and other related

health professions, and his constant interest in the welfare of the individual and the good of the health professions brought many to seek his advice and counsel.

After many years of active service, his retirement is considered a great loss to veterinary medicine and other professions which have been influenced by his work.

The Illinois Interprofessional Council has representation from the following associations: Illinois Medical Society; Illinois State Dental Society; the Illinois Association of Chiropodists; the Illinois State V.M.A.; and the Illinois Optometric Association.

S/EDMUND A. WERRE, D.D.S.,
Illinois Inter-professional Council.

Left to right—Drs. John G. Hardenbergh, V.M.D., recipient of the Distinguished Service Award of the Illinois Interprofessional Council; O. Norling-Christensen, D.V.M.; and Everett A. Grimmer, D.D.S., president of the Council.



Part III

Secretaries of Constituent Associations

This is the third and last series of secretaries presently serving the constituent associations of the AVMA.

Of the 64 organizations contacted, only 16 were not able or failed to supply a print in time for our deadlines.

Those secretaries not appearing in this feature represented the following: Arizona, Indiana, Manitoba, Mississippi, Missouri, Nevada, New Hampshire, New Jersey, Ontario, Prince Edward Island, Rhode Island, Tennessee, Utah, Wyoming, Puerto Rico, and Cuba.



Alberta
Dr. Ross Walton
(ONT '42)

Canal Zone
Dr. K. C. Zimmerman
(KSU '43)



Connecticut
Dr. Ernest H. Patchen
(OSU '23)



Massachusetts
Dr. Morton Wolf
(MSU '46)

Michigan
Dr. Robert F. Willson
(MSU '36)



Nebraska
Dr. Ordella Geisler,
Secretary (KSU '47)



Nebraska
Mr. Robert W. Garey,
Executive Secretary



New Mexico
Dr. Earl L. Payne
(COL '51)

Quebec
Dr. L.P.E. Choquette
(MON '39)



N.A.F.V.
Dr. F. L. Herchenroeder
(STJ '18)

New Meat Hygiene Training Center Established in Chicago

The first class of 13 students met April 4, 1960, at the newly-established Meat Hygiene Training Center, thus marking the beginning of a new training concept for the Meat Inspection Division of the Agricultural Research Service.

The trainees, all veterinarians with an average of 12 to 18 months' experience with the Federal Meat Inspection Service, are the first of several groups selected from throughout the nation to attend the two-week veterinary meat hygiene course at the Center. During this training period, the students will receive instruction in the broad responsibilities of the Meat Inspection Division and discuss the developments in the field of meat technology and meat hygiene.

The Meat Hygiene Training Center is located in the 3½ million dollar International House on the campus of the University of Chicago at 1414 East 59th St., Chicago, Ill. Students will also live at the International House, which has a cafeteria, snack shop, library, assortment of lounges, barber shop, and other facilities as well as a continuing cultural program for residents.

Following several courses in veterinary



Visitors to the AVMA offices in May were Dr. J. D. Lane (left), head of the procedures and training staff of MID at the new Meat Hygiene Training Center, and Dr. Otto W. Seher (right), assistant director of MID in the northern United States.

meat hygiene, the Center will present courses for nonprofessional meat inspectors, for supervisors, and for other groups where a benefit can be gained by centralized and concentrated training over a period of one or more weeks.

Selected to direct the Training Center is Dr. J. D. Lane of the procedures and training staff, Meat Inspection Division. Instructors will include specialists from the Meat Inspection Division and other U. S. Depart-

First Class at Meat Hygiene Training Center, Chicago, Ill., April 4-15, 1960



Seated, left to right—A. P. Godwin, R. K. Burroughs, W. H. Huber, R. D. Schwake, A. C. Norris, J. D. Willis, A. K. High, R. Baranowsky, R. B. Albritton, J. K. Payne, J. R. Pavelka, and R. Wagner.

Standing, left to right—V. H. Berry, instructor; J. D. Lane, head; H. M. Steinmetz, instructor.

ment of Agriculture agencies; representatives from industry; research organizations; and educational institutions.

In addition to organizing and carrying out the responsibilities of centralized training, the Center expects to initiate a program of abstracting information from many national and international publications. The abstracts will concern information of value to regulatory veterinarians and will serve as a source of advancing information to the thousands of veterinarians working in this field throughout the veterinary community.

**AVMA Greets Eastern Visitor—
Dr. C. G. Durbin**



Dr. Charles G. Durbin (center), veterinary medical director, veterinary medical branch, of the Food and Drug Administration's Bureau of Medicine, conferred recently with AVMA staff members in Chicago, Ill., on antibiotic residues in milk.

To the left of Dr. Durbin is Dr. James R. Hay, AVMA director of professional relations. Dr. L. Meyer Jones, AVMA director of scientific activities, is at right.

American Public Health Association to Meet in San Francisco this Fall

The 88th annual meeting of the American Public Health Association, scheduled for the Civic Auditorium in San Francisco, Calif., Oct. 31-Nov. 4, 1960, is slated to be the largest gathering of public health specialists ever held on the West Coast.

Major sessions will include an opening symposium on man and his changing environment and a closing symposium on present status and the future directions of work in

malignant diseases. At least 60 related health organizations are also scheduling meetings in conjunction with the Association's sessions.

Headquarters of the APHA are at 1790 Broadway, New York 19, N.Y. Executive director is Dr. Berwyn F. Mattison (M.D.).

Among the States and Provinces

Alabama

AUBURN—STATE ASSOCIATION'S NEW ROSTER.—The officers of the Alabama V.M.A. for 1960-1961 are as follows: Drs. J. R. Dunlap, Guntersville, president; W. P. Monroe, Anniston, president-elect; R. O. Moore, Tuscaloosa, vice-president; and M. K. Heath, Auburn, secretary-treasurer (see the JOURNAL, June 1, 1960, pp. 579-580, for a resume of the Alabama V.M.A. is meeting in Mobile).

s/M. K. HEATH, Secretary.

Colorado

STATE ASSOCIATION PRESENTS COMMENDATION TO MR. LEON L. HOPKINS.—The Colorado V.M.A. and the College of Veterinary Medicine, Colorado State University, jointly recognize the importance of ancillary sciences, arts, and industries to the understanding and control of animal diseases.

Animal husbandry, both as a science and as an industry, chemistry, physics, mathematics, botany, and zoology are activities which commonly contribute to veterinary medicine. Some years, the Colorado V.M.A. commends, through award, an outstanding lay contributor to the advancement of veterinary medicine.

This year the recipient is Mr. Leon L. Hopkins, Center, Colo. Born Aug. 13, 1911, at Wray, Colo., Mr. Hopkins has resided in and continuously served in the state. In 1935, he graduated with a B. S. degree in animal husbandry and, in 1942, he received an M.S. degree in vocational education, both from Colorado State University. From 1935 through 1946, he taught school at Carr and Del Norte, Colo., and during 1947 and 1948, he was an instructor in vocational agriculture for veterans and was stationed in Weld County. From 1949 to date, he has



Dr. Rue Jensen, dean, College of Veterinary Medicine, Colorado State University (left), bestows the Colorado V.M.A.'s commendation on Mr. Leon L. Hopkins (right) in appreciation for his help in advancing veterinary medicine and in promulgating the application of the profession's principles to the sheep industry, Feb. 16, 1960.

been county agricultural agent at Saguache County.

In the capacity of county agent, he has rendered public service, not only to his home Saguache County, but to the livestock industry in general and to the veterinary medical profession. During recent years, vibriosis, and acute infectious disease of sheep, has been prevalent and costly in his county. After consultation with practicing veterinarians, the extension veterinarian, and others, Mr. Hopkins urged all sheep owners to cooperate in the study of vibriosis by submitting aborted lambs to the diagnostic laboratory.

During the summer of 1949, again after consultation with members of the veterinary medical profession, he collected pertinent statistical data from all owners of flocks where the disease occurred during the spring of 1959. This provided important information on the epizootiology and transmission of vibriosis. In addition, sheep producers of the county were alerted to the importance and extent of the disease. During the summer and fall 1959, he and his colleague county agents, Mr. Charles Y. Urano and Mr. Woodrow W. Wilson, arranged with many sheep growers for field testing of an experimental vaccine developed at Colorado State University against vibriosis.

Connecticut

STORRS—DR. S. W. NIELSEN JOINS UNIVERSITY OF CONNECTICUT.—Dr. Svend W. Nielsen, a Danish-born authority on cancer in domestic animals, has been named to the faculty of the Department of Animal Diseases of the University of Connecticut, as of April 23, 1960.

Cancer research is one of Dr. Nielsen's primary interests. His studies have dealt with the pathologic effect of radiation and the effect of air pollution on the respiratory tracts of domestic animals. Many of the results of these studies may one day be applicable in the field of human medicine. In addition to his research activities at the Storrs Agricultural Experiment Station, Dr. Nielsen will teach animal pathology at the University.

Dr. Nielsen graduated from the Royal Veterinary and Agricultural College in Copenhagen in 1951. Following 18 months' internship in Boston, he joined the staff of the Ontario Veterinary College in Guelph and directed his attention to teaching, disease diagnosis, and research. He earned his Ph.D. degree at Ohio State University last year.

He is a member of the Association for the Advancement of Science, the AVMA, the American College of Veterinary Pathologists, and other professional organizations. He is a naturalized citizen of the United States.

* * *

STORRS—HEART AND VASCULAR DISEASE RESEARCH GETS \$100,000 AT U. OF CONNECTICUT.—A \$100,000 grant for a five-year study of heart and blood vessel disease has been awarded to scientists at the Storrs Agricultural Experiment Station at the University of Connecticut by the National Institutes of Health of the U. S. Public Health Service. Dr. Charles F. Helmbolt (MSU '38), head of the Department of Animal Diseases, will direct the research.

Mink will serve as the "guinea pigs." These animals display vividly the blood and tissue changes which occur as a result of cardiovascular diseases, the commonest killer of man. The Mink Farmers Research Foundation is also supporting the study with a \$4,000 grant this year.

Since some blood vessel diseases of livestock, domestic animals, and man are not well understood, the Storrs scientists plan to

study the changes which occur in mink to gain a better insight into the problems involved. One of these mink diseases is known as Aleutian mink disease and is similar to rheumatoid arthritis, rheumatic fever, and other diseases. Some scientists have argued that Aleutian mink disease is a form of leukemia. Storrs scientists do not yet support this theory.

Illinois

SPRINGFIELD—DIGEST OF STATE ASSOCIATION'S ANNUAL CONVENTION.—The 78th annual convention of the Illinois State V.M.A. was held at the Hotel Abraham Lincoln, Feb. 15-17, 1960.

Contents of the scientific program included: Drs. E. J. Wilson, veterinarian in charge, USDA, ARS, Animal Disease Eradication Division—federal disease control activities in Illinois and changes in Brucellosis Ring Test regulations; I. M. Paton, Kansas City, Mo.—research on acanthosis nigricans; R. L. Parker, Poynette, Wis.—Midwest rabies investigations; J. R. Dinsmore, Glenview—canine urinary problems; R. P. Link (Ph.D.), Urbana—x-ray badge service; E. R. Walker, Pawhuska, Okla.—Quarter Horse problems, equine restraint, etc.; Lew Mix (Ph.D.), Cayuga, N.Y.—dairy nutrition; H. T. Helms, Trimble, Mo.—confinement feeding of swine; R. L. Knudson, Washington, D.C.—new horizons in regulatory veterinary medicine; G. T. Woods, Urbana—the veterinarian and public health; and A. K. Merriman, Springfield—new legislation.

Mr. Brian M. Forster, AVMA director of public information, delivered an address on the Boy Scout program for veterinary public relations and Mr. Harry H. Costello, publisher, *Modern Veterinary Practice*, discussed the economics in general practice—also on the first day of the program.

The morning of the second day was composed of sessions on small animal practice, sanitary science, and general practice. Among the speakers and their respective subjects heard February 16 were: Drs. L. E. St. Clair, Urbana—anatomy of the normal canine coxofemoral joint and neurologic anatomy of the hind leg of the dog; D. Maksic, Urbana—radiologic diagnosis of diseases of the coxofemoral joint; L. N. Atkinson, Kirkwood—surgical treatment of diseases of the coxofemoral joint and anesthesia; L. A. Johnson, South Bend, Ind.—anato-

my, diagnosis, and treatment of problems of the canine stifle joint; E. Small, Urbana—neurologic disturbances of the hind leg of the dog; J. W. Neff, Hinsdale—simple splints and casts for fractures of the hind leg of the dog; G. W. Hess, Springfield—county veterinarian; J. R. Brown, Ottawa—scabies control in LaSalle County; E. I. Pilchard, Urbana—preparation of laboratory specimens; E. E. Leasure, Manhattan, Kan.—veterinary medicine and animal disease control in India; and W. L. Wake, Chicago, and W. G. Evans, Springfield—stomatitis-like condition in feeder cattle.

Later in the afternoon, the following program ensued: Drs. L. J. Miller, Lincoln—practice truck—Volkswagen; A. A. Bottorff, Williamsburg—collecting sterile milk samples; C. E. Loomis, Ottawa—practice truck—medical coach; R. A. Grant, Wyoming—urethrotomy and vaccination technique; H. J. Brouwer, Leland—practice truck—astoria body; P. B. Doby, Springfield—oxy-



Dr. Edward C. Khuen (right) of Evanston receives the Illinois State V.M.A.'s Award as "Veterinarian of the Year" from Dr. A. K. Merriman (left), then I.S.V.M.A. president. Presentation of the plaque took place at the Hotel Abraham Lincoln in Springfield, Feb. 16, 1960.

gen therapy in newborn calves; R. M. Thomas, Urbana—canine lead poisoning; G. F. Otto (Sc.D.), North Chicago, differentiation of the canine filaroids and their treatment; T. H. Brasmer, Danville—feeding the hospitalized patient; T. J. Lafeber, Niles—

client cooperation; J. S. Sickles, Bloomfield, N.J.—griseofulvin as a treatment for ring-worm in small animals; and J. L. Bittle, Indianapolis, Ind.—feline respiratory diseases.

Veterinarian of the Year

Dr. Edward C. Khuen (OSU '20), Evanston, Ill., was honored as Illinois State V.M.A.'s "Veterinarian of the Year" during the Association's annual banquet on February 16. Dr. Khuen was cited for his outstanding service to the profession during the past year, particularly in matters of legislation. He is head of the Cook County Department of Rabies Control.

New Roster

Newly elected officers of the Association are as follows: Drs. W. G. Raudabaugh, Piper City, president; J. J. Smith, Waverly, president-elect; C. B. Hostetler, Des Plaines, executive secretary; and R. P. Link, Urbana, treasurer.

Iowa

ANKENY—REPORT OF LATEST CENTRAL IOWA ASSOCIATION MEETINGS.—On April 18, 1960, the Central Iowa V.M.A. held its regular dinner meeting at the Breese House. Dr. Hank Shields of Greeley, Colo., discussed "Feedlot Diseases of Cattle."

At the Association's meeting on May 16, also held at the Breese House in Ankeny, Dr. Fred Neal of Iowa State University spoke on "General Sheep Problems."

s/M. E. POMEROY, Secretary.

Kansas

WICHITA—THE STATE ASSOCIATION'S ANNUAL CONFERENCE.—The fifty-sixth annual convention of the Kansas V.M.A. was held in Mid-January 1960, at the Hotel Broadview.

Appearing on the scientific portion of the program were: Drs. E. H. Coles, Kansas State University—the place of the laboratory in practice and rapid laboratory tests and their interpretation; H. P. Callaway, Waverly, Mo.—swine practice problems; E. L. Baldwin, Jr., Omaha, Neb.—clostridial enterotoxemias and edema disease of swine; R. P. Link, University of Illinois—insecticide poisoning in animals; A. C. Sears, Fort Worth, Texas—small animal hospital construction and remodeling and a system of

records and accounting for a small animal hospital; G. A. Severin, Colorado State University—problems in small animal diagnosis.

Veterinarian of the Year

Presentation of the Kansas "Veterinarian of the Year" Award was made to Dr. Frank W. Jordan (KSU '39), Abilene, at the Association's banquet in the North Ballroom of the Hotel Broadview, January 11.

Dr. Jordan is a past-president of the Kansas V.M.A. and is currently a member of its constitution committee. He is also chair-



The 1959 Kansas "Veterinarian of the Year" Award was presented to Dr. Frank W. Jordan (left) of Abilene, by Dr. L. D. Jernigan (right) of Council Grove, then president of the Kansas V.M.A.

man of the K.V.M.A. feed-nutrition committee and has taken an active part in the previous two veterinary-nutrition conferences held in Kansas City, Mo.

Association's Roster

The following officers were elected to serve the Association for 1960: Drs. Albert C. Schwartz, Jr., Salina, president; Fayne H. Oberst, Manhattan, president-elect; and Melvin W. Osburn, Manhattan, secretary-treasurer.

s/M. W. OSBURN, Secretary.

Montana

Bozeman—COLLEGE EXPANDS VETERINARY-WISE.—After nearly two years of planning, construction was begun April 29, 1960, on the new Montana Veterinary Center located at Montana State College. Upon completion early next year, the main laboratory

building will house the Veterinary Research Laboratory of Montana State College and the diagnostic service of the Montana Livestock Sanitary Board.

The total building fund is \$790,000 of which \$290,000 has been provided by the Livestock Sanitary Board from livestock taxes. The Research Laboratory's share is \$500,000, half of which was specially appropriated by the state legislature and matched by a grant from the National Institutes of Health.

At the time the decision was made to build a new veterinary laboratory at Montana State, the Livestock Sanitary Board was looking into the possibilities of getting larger and more modern quarters for its diagnostic work other than those available at the Helena site.

A rare opportunity was presented for developing an integrated modern research and diagnostic service. Two hundred acres of pasture land one-half mile off campus was given over by the College for construction of the Center. The architects designed a functional low-cost, highly efficient, attractive building encompassing the required mechanical facilities.

The main building is to be a single story structure of concrete, steel, and brick, with four wings radiating from a central core and covering an area of 28,000 sq. ft. Three of the four wings will be used by the research

section and the other wing by the diagnostic service. The central core consisting of library, kitchen, media preparation, glassware cleaning, sterilization areas, and necropsy rooms will be shared jointly.

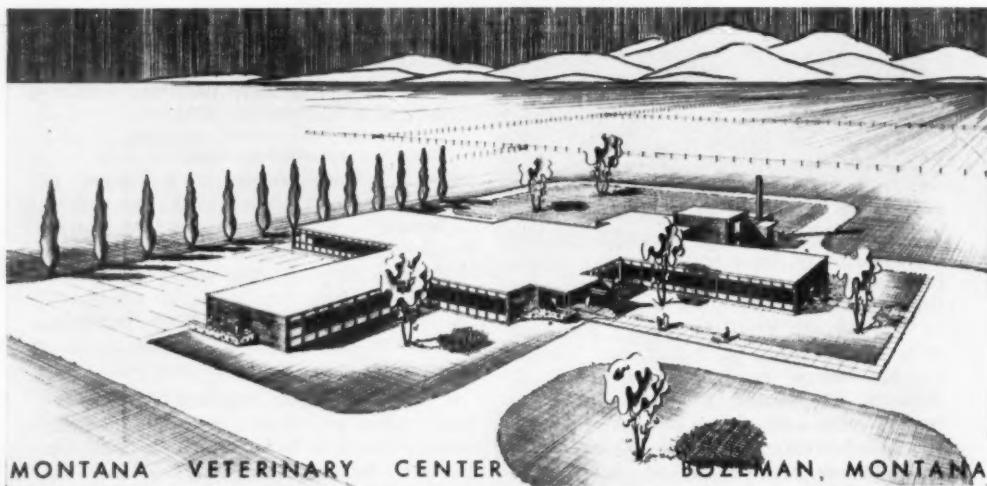
The research and diagnostic laboratories will be staffed separately except for some personnel in the areas which are occupied jointly, such as the library, kitchen-preparation, receiving-shipping, and necropsy rooms. There will be bacteriology, virology, serology, chemistry, and pathology laboratories for each service.

Dr. E. A. Tunnicliff, head of the Veterinary Research Laboratory, and Dr. J. W. Safford, state veterinarian, feel that such an arrangement will provide the maximum efficiency at the lowest cost. Having the staffs of the two services close together will also permit easy access for consultations.

Maximum control of infectious agents will be achieved by total air conditioning and by a system of air locks, combined with controlled pressures. The bacteriology and virology sections are located in one wing, but are entered separately. Each wing is air-locked from the rest of the building, and individual parts of them. Infected laboratory animal quarters are, in turn, separated by air locks.

Any animals brought into these areas will be disposed of by incineration directly into the animal area, as will any waste mate-

The New Montana Veterinary Center



The architect's scale model drawing of the new Montana Veterinary Center at Bozeman. Work on the center was begun April 29.

rial from the animals. A portion of the air in the building will be recycled, but in areas where infectious agents may be present, the air will be used only once. A complete change of air will take place every seven minutes, and each room will have its own temperature control.

Other research facilities to be constructed at this time, include: a clinic building for the care and treatment of experimental animals, sorting pens, weighing scales, squeeze chutes, and the necessary corrals for the handling of groups of sheep and cattle under experimentation. Shelter sheds for the lambing of 500 ewes and the rearing of the lambs are included in the program.

New York

ITHACA—RECENT VETERINARY EXPANSIONS NAMED AT CORNELL.—The administration wing of Cornell University's New York State Veterinary College has recently been named Jacob Gould Schurman Hall, in memory of the third president of the University.

Announcement that other facilities of the veterinary college bear the names of former distinguished members of the College's faculty was also released. The structures which have been named are part of the new physical plant of the College which was completed three years ago.

Jacob Gould Schurman was president of the University from 1892 until 1920. It was during his administration and largely through his efforts that the first state-supported college—the veterinary college—was established at Cornell in 1895.

A redistribution of certain branches of science then being taught at Cornell, the introduction of new branches and the assembling of a distinguished faculty from other parts of the campus and from outside the University was accomplished under President Schurman's direction to give the then new veterinary college a place in the forefront among American veterinary institutions.

Four members of the original faculty assembled by President Schurman have been memorialized by having veterinary college facilities named after them.

The anatomy offices and laboratories have been named the Hopkins-Gage Laboratory after two professors who spent most of their careers together in close association with the problems of anatomical research. Grant Sherman Hopkins and Simon H. Gage were both professors of anatomy well along in

their careers when they transferred from the College of Arts and Sciences to the veterinary college.

The large and small animal clinics have been named the Walter L. Williams Clinic in memory of one of the outstanding veterinarians of his day. Walter L. Williams held the title of professor of veterinary surgery, obstetrics, zootechny, and jurisprudence when the College opened its doors.

The physiology laboratories have been named the Pierre A. Fish Laboratory. Before joining the college faculty as assistant professor of veterinary and comparative physiology, *materia medica*, and pharmacy, Dr. Fish had been an instructor in physiology and vertebrate zoology at Cornell.

The seminary room now bears the name, The Hagan Room, in honor of William A. Hagan, who retired as dean of the College last year. He had been a member of its faculty during 43 of its then 64 years. He is now director of the new federal Animal Disease Laboratory at Ames, Iowa.

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GREENPORT, L. I.—DR. W. R. HESS TO DO RESEARCH IN AFRICA.—Dr. William R. Hess, veterinary bacteriologist at the Plum Island Animal Disease Laboratory, has recently accepted an assignment in Muguga, Kenya, East Africa, where he will join a team of research scientists from the Animal Disease and Parasite Research Division in Beltsville, Md., who are presently working on African Swine Fever and other exotic animal diseases in cooperation with the East Africa High Commission at their laboratory in Muguga.

s/HOWARD W. JOHNSON, Director, Anim. Dis. & Parasite Res. Div., Beltsville, Md.

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ITHACA—1960 CORNELL NUTRITION CONFERENCE SCHEDULED.—Cornell University's 1960 Nutrition Conference for Feed Manufacturers will be held November 2-4 at the Statler Hilton Hotel in Buffalo, N. Y.

The conference is sponsored by the departments of poultry and animal husbandry, biochemistry and nutrition, and the Graduate School of Nutrition at Cornell University. It is being conducted in cooperation with the American Feed Manufacturers' Association.

This year's chairman is Prof. Harold H. Williams, head of the Department of Bio-

chemistry and Nutrition at Cornell. Professor D. E. Hogue of the Department of Animal Husbandry is vice-chairman.

Copies of the conference program and cards providing for preregistration and hotel reservations will be mailed in late August to persons who attended previous conferences. Persons not on the conference mailing list may obtain copies of this material by writing to: Prof. Harold H. Williams, Savage Hall, Cornell University, Ithaca, N. Y.

Veterinary Military News

Georgia

HEADQUARTERS THIRD U.S. ARMY, FORT MCPHERSON.—Brig. Gen. Russell McNeillis, chief, Veterinary Corps, Washington, D.C., was the featured speaker among 50 veterinary officers of the Army and the Air Force attending the Third U.S. Army veterinary training conference here recently.

The purpose of the conference was to update the conferees on the new developments in public health and on the newer methods of procuring inspection policies. Biological

warfare was also discussed in considerable length.

Dr. Ernest S. Tierkel, chief, rabies control activities, Department of Health Education and Welfare, submitted a report on a recent research experiment in rabies control.

Following discussion of pertinent veterinary topics, the entire body of visiting personnel inspected the veterinary section of the medical laboratory and was directed through the unit's functions by Lt. Anthony Palminteri, assistant chief, veterinary services, Third U.S. Army Medical Laboratory, at Fort McPherson.

The Third U.S. Army directs and trains over 150,000 troops in the seven southeastern states. The land area controlled by the Army is slightly larger than the state of Rhode Island.

State Board Examinations

ARIZONA—June 22-23, 1960, Arizona State College, Flagstaff, Ariz. Deadline for applications was June 12; the fee is \$25. Dr. William E. Snodgrass, Secretary, 1612 W. Washington St., Phoenix, Ariz.

ARKANSAS—June 16-17, 1960, 2400 East Fifth St., Little Rock, Ark. Telephone # is Franklin 2-5129; the fee is \$10. Dr. David Ibsen, 2400 East Fifth St., Little Rock, Ark., Secretary.

Illinois

Colonel Ehrlich Receives Award

At right, Lt. Col. David Ehrlich, Fifth U. S. Army Veterinary Inspection Service, receives a Certificate of Retirement in a ceremony April 29, 1960. Col. William E. Jennings (left) made the presentation.

Colonel Ehrlich, who has been at the headquarters since July 24, 1959, plans to practice veterinary medicine in his hometown, Heber Springs, Ark.



U. S. Army Photograph

CALIFORNIA—June 14-16, 1960, School of Veterinary Medicine, University of California, Davis, Calif. Deadline for applications was 30 days prior to the examination for approved veterinary school graduates and 90 days for foreign applicants; the fee is \$25. William E. Barbeau, Board of Examiners in Veterinary Medicine, 1020 N. St., Sacramento 14, Calif.

CONNECTICUT—July 12-14, 1960, Hartford, Conn. Deadline for applications is July 2; the fee is \$50. Dr. Salo Jones, Secretary, Room 285, State Office Building, Hartford, Conn.

DISTRICT OF COLUMBIA—June 26, 1960, Department of Occupations and Professions, 1740 Massachusetts Ave., N.W., Washington, D.C. Deadline for applications was June 2; the fee is \$25. Dr. Alan F. McEwan, Secretary, Board of Examiners in Veterinary Medicine, 1740 Massachusetts Ave., N.W., Washington, D.C.

FLORIDA—June 13-15, 1960, Municipal Auditorium, Miami, Fla. (Headquarters—Biscayne Terrace Hotel). Deadline for applications was June 1, the fee is \$25. Dr. E. F. Thomas, Secretary, Florida State Board of Veterinary Medical Examiners, 4937 S. Tamiami Trail, Sarasota, Fla.

HAWAII—Sept. 22-24, 1960, Honolulu, Hawaii. Deadline for applications is Aug. 22; the fee is \$25. Dr. Wilson M. Pang, Secretary, 1683 Kalakaua Ave., Honolulu 14, Hawaii.

ILLINOIS—June 29-July 1, 1960, Chicago office of the Department of Registration and Education, 160 N. LaSalle St., Chicago, Ill. Deadline for applications was June 14; the fee is \$20. Mr. Fredric B. Selcke, Superintendent of Registration, Capitol Building, Springfield, Ill.

INDIANA—July 12-13, 1960, State House, Indianapolis, Ind., at 8:00 a.m. Deadline for applications was 30 days preceding the day of the regular meeting for the applicants applying by examination; 15 days if applying by reciprocity. Those applying for examination, a \$40 fee must accompany the application; for those coming in by reciprocity, the fee is \$50. Dr. Joe W. Green, Secretary Veterinary Examining Board, State Board of Health Building, Room 422, 611 Park Ave., Indianapolis, Ind.

KENTUCKY—July 25, 1960, Capitol Building, Frankfort, Ky. Deadline for applications is July 11; the fee is \$25. For Applications and information, write: Mr. William E. Johnson, 319 Ann St., Frankfort, Ky. (A special June examination is usually given; the exact date has not been set.)

MAINE—July 11-12, 1960, Dr. Libby's office, 6th Floor, Office Building, Augusta, Maine. Deadline for applications is 15 days before the examination. There is a \$20 fee with each application. Dr. E. C. Moore, Secretary, Turner Center, Maine.

MASSACHUSETTS—June 22-24, 1960, University of Massachusetts, Amherst, Mass. Deadline for applications is at least one week prior to the examinations date; the fee is \$25. Dr. Edward A. Zullo, Secretary, Board of Registration in Veterinary Medicine, Room 33, State House, Boston 33, Mass.

MICHIGAN—June 20-21, 1960, Veterinary Building, Room 146, Michigan State University, East Lansing, Mich., at 8:00 a.m. Deadline for applications was June 5; \$25 fee is to accompany applications. Dr. John F. Quinn, Corresponding Secretary, Board of Veterinary Examiners, Sixth Floor, Lewis Cass Building, Lansing 13, Mich.

MINNESOTA—July 12-13, 1960, College of Veterinary Medicine, University of Minnesota, St. Paul Campus, St. Paul 1, Minn., at 8:00 a.m. each day. Deadline for applications was 30 days prior to the examination; the fee is \$25. Dr. A. C. Spannaus, Executive Secretary, Veterinary Examining Board, Route #1, Waconia, Minn.

MISSISSIPPI—June 21, 1960, Woolfolk State Building, Jackson, Miss. Deadline for the applications was June 11; the fee is \$25. Dr. William L. Gates, Secretary, Box 417, Clarksdale, Miss.

MONTANA—June 20-22, 1960, Senate Chamber, Helena, Mont. Deadline for applications was May 31; the fee is \$25. Dr. J. N. Safford, Secretary, Capitol Station, Helena, Mont.

NEVADA—July 23, 1960, Tonopah, Nev. Deadline for applications was June 1; the fee is \$10. Dr. E. H. Stodtmeister, 102 "B" St., Sparks, Nev.

NEW HAMPSHIRE—July 5, 1960, State House, Concord, N.H. Deadline for applications is June 25; the fee is \$15. Dr. J. P. Seraichick, Secretary, Board of Veterinary Examiners, Chesterfield Rd., Keene, N.H.

NEW JERSEY—June 24-25, 1960, State House, Trenton, N.J. Deadline for applications was June 14; the fee is \$25. Dr. Robert R. Shomer, Secretary, 1680 Teaneck Rd., N.J.

NEW MEXICO—June 17-18, 1960, State Capitol Building, Santa Fe, N.M. Deadline was two weeks prior to the examination date; a \$25 fee is to accompany applications. Dr. Edwin J. Smith, Secretary, State Board of Veterinary Examiners, P.O. Box 4385, Santa Fe, N.M.

NEW YORK—June 15-16, 1960 (practical), June 28-July 1, 1960 (written), at Ithaca, New York City, Buffalo, Syracuse, Rochester, and Albany, N.Y. Applications must be received 30 days before date of examination; the fee is \$40. Mr. James O. Hoyle, 23 South Pearl St., Albany, N.Y.

NORTH CAROLINA—June 20-22, 1960, Grove Park Inn, Asheville, N.C. Dr. James I. Cornwell, Secretary-Treasurer, North Carolina State Veterinary Examining Board, P.O. Box 9038, Asheville, N.C.

NORTH DAKOTA—Oct. 12-13, 1960, Van Es Building, North Dakota Agricultural College, Fargo, N.D. Deadline for applications is about ten days prior to the examination date; the fee is \$15. Dr. M. C. Hawn, Secretary, N. D. Veterinary Medical Examining Board, 1407-13th St. NOrth, Fargo, N.D.

PENNSYLVANIA—June 16-17, 1960, School of Veterinary Medicine, University of Pennsylvania, 39th & Woodland Ave., Philadelphia, Pa. Deadline for applications was May 15; the fee is \$20. Dr. Charles J. Hollister, Secretary, State Board of Veterinary Medical Examiners, Box 911, Harrisburg, Pa.

PUERTO RICO—Aug. 2, 1960, Division of Examining Boards, Comercio 452, Carrera's Building, San Juan, P.R. Deadline for applications is July 3; the fee is \$10, the license fee is \$5, and one P.R. Revenue Stamp of \$1. Herminio Mendez Herrera, Secretary, Box 3271, San Juan, P.R.

RHODE ISLAND—July 12-13, 1960, Division of Animal Industry, 505 Veterans' Memorial Bldg., 83 Park St., Providence, R.I. Deadline for applications is July 1. Dr. Thomas E. Grennan, Secretary, Providence, R.I.

SASKATCHEWAN—June 21-23, 1960, University of Saskatchewan, Saskatoon, Can. Deadline for application was June 1; the fee is \$25. Dr. W. Turnbull, Health Department, City Hall, Saskatoon, Saskatchewan, Can.

SOUTH CAROLINA—June 16-17, 1960, Columbia, S.C. Deadline for applications was June 2; the fee is \$25. Dr. H. L. Sutherland, Secretary, P.O. Box 87, Union, S.C., secretary.

SOUTH DAKOTA—June 20-21, 1960, South Dakota State College, Brookings, S.D. Deadline for applications was June 1; the fee is \$10. Dr. M. O. Mitchell, Secretary, Veterinary Examining Board, State Office Building, Pierre, S. D.

TENNESSEE—June 27-28, 1960, Cordell Hull Building, Capitol Grounds, Nashville, Tenn. Deadline for applications is June 25; the fee is \$25. Dr. T. H. Bullington, Secretary, R.F.D. #3, Fayetteville, Tenn.

UTAH—June 30-July 1, 1960, State Capitol Building, Department of Business Registration, Salt Lake City, Utah. Applications should be submitted to Mr. Frank E. Lees, Director of the Department of Business Regulation and Registration Division, State Capitol Building, Salt Lake City, Utah, by June 15. Registration fee is \$15.

VIRGINIA—June 30-July 1, 1960, Senate Chamber, Capitol Building, Richmond, Va. Deadline for applications was May 30; the fee is \$25. Mr. T. N. Burton, Secretary, P.O. Box 1-X, Richmond 2, Va.

WEST VIRGINIA—June 20, 1960, Capitol Building, Room E—117 (ground floor of the east wing), Charleston, W. Va. For applications and information, write: Dr. Harry J. Fallon, Secretary-Treasurer, 200 Fifth St. West, Huntington, W. Va.

WISCONSIN—June 27-28, 1960, Madison, Wis. Dr. A. A. Erdmann, Chief Veterinarian, State-Federal Cooperative Program, 6 West, State Capitol, Madison 2, Wis.

WYOMING—June 21-22, 1960, State Office Building (third floor, south wing), Cheyenne, Wyo. Deadline for applications was June 6; the fee was \$25. Dr. G. H. Good, Secretary, State Office Building, Cheyenne, Wyo.

Deaths

Star indicates member of AVMA

★E. H. Baumann (OSU '04), 78, Teaneck, N.Y., died March 14, 1959.

Dr. Baumann was made a life member of the AVMA in 1956. He was a native of Paterson, N.J.

★James G. Fish, Sr. (OSU '21), 59, Jacksonville, Fla., died as the result of a heart attack while visiting his farm in Quitman on March 1, 1960.

A native of Chicago, Dr. Fish moved to Jacksonville following his graduation from Ohio State in 1921. He had been associated with the city board of health for 29 years. Dr. Fish was instrumental in developing a program to eradicate tuberculosis in dairy herds and later became chief inspector for the health department as well as operating his general veterinary practice. For the last few years, he had been in partnership with one of his five sons, Dr. James G. Fish, Jr. (TEX '54).

In addition to his son, Dr. Fish's brother, Charles C. Fish (OSU '22) of Tallahassee is also a veterinarian.

Gerald A. Landstrum (ISU '19), 70, Barnes City, Iowa, died at his home in Barnes City, on March 10, 1960.

★J. A. Lanza (OKL '51), 38, Duncan, Okla., died Feb. 2, 1960, from a heart attack.

A veteran of World War II, Dr. Lanza established his practice in Duncan in 1957, after moving from Pond Creek. Dr. Lanza had been born in Salinas, Puerto Rico.

★E. N. Liljberg (KCV '15), 67, Grantsburg, Wis., died of carcinoma of the pancreas and liver, after an illness of three months.

A general practitioner, Dr. Liljberg established his practice in Grantsburg in 1915 and, for many years, was the only veterinarian available in the area. Working in a radius of 40 to 50 miles around his home town, Dr. Liljberg covered the northern Wisconsin and Minnesota area.

Holding membership in many civic organizations, he also served on the public school board as treasurer for many years.

★George W. Minshall (CVC '04), 81, Viroqua, Wis., died Feb. 15, 1960, following a heart attack.

He was a practicing veterinarian in Viroqua from 1904 until the day of his death. Dr. Minshall was a well-known trainer and racer of trotting horses and had driven in harness races since he was 16 years old.

Henry W. Riley (OSU '06), 81, La Grande, Ore., died March 20, 1960.

Born in Ohio, Dr. Riley had lived in La Grande for 65 years and had practiced there until his retirement several years ago. At the time of his death, he was a life member of the Oregon V.M.A.

Albert Charles Schafstall (ONT '10), 77, New Washington, Ohio, died March 12, 1960. He had been in ill health for two years and had undergone surgery a few days before his death.

Born in Donaldson, Pa., Dr. Schafstall had practiced in New Washington all but the first two years of his career when he interned at Bellevue.

Edward L. Stam (WSU '20), 80, Phoenix, Ariz., died Feb. 14, 1960.

Dr. Stam initially practiced in Oklahoma, moving to Phoenix in 1925. In 1932, he was appointed state veterinarian and, from 1939 until his retirement in 1951, he was city veterinarian.

★George E. Totten (CVC '98), 84, Washington, D.C., died May 15, 1959, of a coronary occlusion.

Dr. Totten was connected with the former BAI in meat inspection almost his entire professional life from his first appointment in August, 1899, until his retirement as chief of meat inspection in February, 1945.

In 1956, he was awarded the Harvey Wiley Award.

Women's Auxiliary

. . . Honor Roll Achievements

The advancement of the veterinary profession is the purpose and aim of the Auxiliary, and individual wives of veterinarians—members of 45 state and three provincial auxiliaries—are the national organization's strength and unity. So Point No. 1 on the Honor Roll is very important—the membership point.

Honor Roll Requirements

Last year 19 state and five regional auxiliaries qualified for 100 per cent, making all the necessary six points. The Honor Roll will be continued this year with the same requirements, except the membership requirements have been changed as follows: 15 per cent increase between Jan. 1, 1959, and Jan. 1, 1960 or 50 per cent of potential membership (based on AVMA membership in state

Jan. 1, 1960); and for the regional auxiliaries, 90 per cent of members belonging to both their state and AVMA Auxiliary (certified by state membership officer). We have been justly proud of the accomplishments of the auxiliaries, and know they will continue the fine work during the next year.

Point No. 2 is the reporting of officers and delegations (with AVMA Auxiliary dues paid for 1960) to the vice-president of the House of Delegates within 30 days of the annual meeting.

The effort put forth by all auxiliaries to qualify for Point No. 3 is most gratifying. This is for financial contributions to at least one of the following: Loan, Memorial, Award, or General Fund. In 1959, contributions included: the Student Loan Fund \$2,263; the Award Fund, \$112.50; the Me-



Front row, left to right—Mrs. Chet Griffith, Mrs. C. B. Randall, Mrs. A. L. Starkey, Mrs. Mark Davenport, Mrs. J. J. Fishler, Mrs. Peter S. Roy, Mrs. L. W. Mohney.

Back row—Mrs. O. H. Holler, Mrs. R. H. Fuller, Mrs. K. O. Lassen, Mrs. V. H. Miller, Mrs. C. H. Wetter, Mrs. Keith McMahan, Mrs. M. S. Cover, Mrs. R. G. Pearce, Mrs. James Tucker, Mrs. E. W. Jones, Mrs. W. T. Oglesby. (Five delegates were not photographed.)

memorial Fund, \$338; and the General Fund, \$92.50.

Many auxiliaries increased their contributions to the Student Loan Fund, and made possible an increase in the number of loans which could be granted in 1960. In 1959, there were 26 applications for loans, fourteen were granted and 12 refused due to lack of funds. The generosity of constituent and regional auxiliaries shown in an increase in contributions in 1960, have made loans of \$10,000 possible. This is almost double the amount which was loaned in 1959—that being \$5,750.

Point No. 4 encompasses AVMA Research. This is one of the most important and worthwhile projects of the Auxiliary. The purpose of the Research Fund is to render financial assistance to veterinarians who are interested in obtaining advanced degrees for research or teaching.

100% Auxiliaries and Delegates

Auxiliary

Alabama
Arizona
Delaware
Florida
Illinois
Indiana
Michigan
Kansas
Kentucky
Louisiana
Minnesota
New Mexico
North Carolina
North Dakota
Oklahoma
South Carolina
Washington
West Virginia
Wyoming
Illinois—Chicago
Indiana—Michigan
Michigan—South Fast
Missouri—Gr. St. Louis
Washington—Seattle

Delegate

Mrs. T. C. Fitzgerald
Mrs. K. O. Lassen
Mrs. M. S. Cover
Mrs. Peter S. Roy
Mrs. A. L. Starkey
Mrs. Keith McMahan
Mrs. R. G. Pearce
Mrs. L. W. Mohney
Mrs. O. H. Holler
Mrs. W. T. Oglesby
Mrs. C. H. Wetter
Mrs. Tom Evans
Mrs. C. B. Randall
Mrs. D. E. Flagg
Mrs. E. W. Jones
Mrs. M. R. Blackstock
Mrs. Cher Griffith
Mrs. V. H. Miller
Mrs. James Tucker
Mrs. Mark Davenport
Mrs. J. J. Fishler
Mrs. A. V. Emery
Mrs. W. H. Wertz
Mrs. R. H. Fuller

Point No. 5 concerns the submission of an article on auxiliary news to either the *AVMA JOURNAL* or the *Auxiliary News* immediately after the annual meeting. Through these articles, auxiliary members learn of the newly elected officers, and of the activities of sister auxiliaries. They further help to bring the membership a little closer to one another.

Point No. 6: It is most important to send dues within 30 days of collection. All dues are to be sent to the Women's Auxiliary Clerk, AVMA, 600 S. Michigan Ave., Chicago 5, Ill.

Student Auxiliaries

We cannot place too much emphasis on the work accomplished by our Student Auxiliaries for these women represent an active, interested group. They are laying the foundation for the time when their husbands will be in practice and themselves members of various state auxiliaries.

This year, for the first time—through the efforts of Mrs. Rodgers, the vice-president for Student Auxiliaries—they will have an Honor Roll of their own, similar to that for constituent and regional auxiliaries. We wish them well, and are proud of these student groups.

In closing, I quote a part from Dr. J. H. Madden's paper on public relations at the AVMA meeting in Toronto: "The old saying that the sire is 50 per cent of the herd will have to be revised when we consider the other big half of the veterinary profession—the wives. They are public relations officers personified."

s/MRS. JAMES I. CORNWELL, Vice-President
for the House of Delegates.

Delaware

NEWARK.—The Women's Auxiliary to the Delaware V.M.A. met recently at the home of Mrs. Morris Cover, Oaklands, to plan projects for the ensuing year.

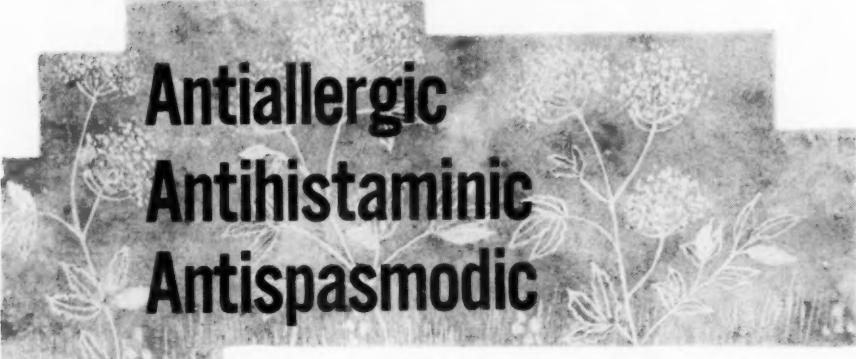
The Auxiliary's party at the Christiana Community Center, 800 E. 7th Street, Wilmington, held on May 25, resulted from this meeting.

In addition, on September 29, the Auxiliary will meet for luncheon at the home of Mrs. George Rosenberger, 828 Philadelphia Pike, Wilmington, at which time a representative from the Salvation Army will discuss a potential Christmas project—outfitting dolls.

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PROFESSIONAL LITERATURE

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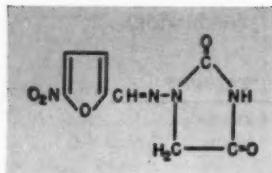
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veterinary

FURADANTIN, a clinically important member of the unique nitrofuran family, is an ideal therapeutic agent in small-animal urinary tract infections and canine tracheobronchitis. "The drug [FURADANTIN] possesses a wide antibacterial spectrum and appears to lack the bacterial-resistance-producing potential of penicillin and other antibiotics."¹

FURADANTIN displays unusual effectiveness against the majority of common urinary tract pathogens, including resistant strains of *Pseudomonas* sp., *E. coli*, and staphylococci. Its rapid rate of absorption and excretion following oral administration and specific affinity for the urinary tract—where it reaches high bactericidal concentrations in the urine—help explain why FURADANTIN is the drug of choice in urinary tract disease.

FURADANTIN exhibits marked antimicrobial activity and maintains the therapeutic response even in the presence of blood and pus that may be found in the urine of affected animals. Its exceptional solubility over a wide pH range avoids the likelihood of crystalluria. Superinfections with fungi, anaphylaxis and blood dyscrasias have not been reported in animals. Thus with FURADANTIN the veterinary practitioner may now achieve a greater number of clinical recoveries in the daily management of small-animal urologic infections and canine tracheobronchitis.



EATON LABORATORIES, NORWICH, NEW YORK

WHAT IS YOUR Diagnosis?

Make your diagnosis from the pictures below—then turn the page ►

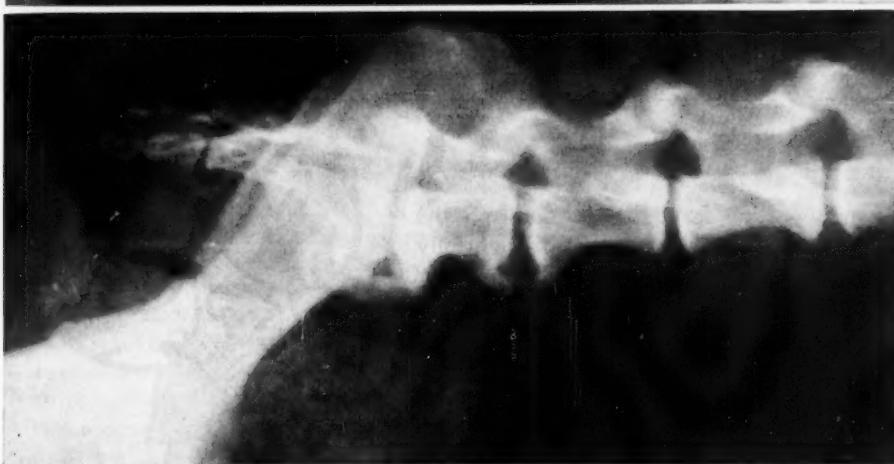


Fig. 1 (Above)—Lateral recumbent radiograph of the lumbar vertebrae of the Boxer (case 1).

Fig. 2 (Below)—Lateral recumbent radiograph of the lumbar vertebrae of the Boxer (case 2).

History.—Two cases are presented for diagnosis and for an evaluation of the anticipated crippling effect of the back lesions. (1) A female Boxer, 9 years old, was suspected of having pyometra, and a lateral recumbent radiograph of the abdomen was taken (fig. 1). Your attention is called to the appearance of the lumbar vertebrae. This dog shows no disability as the result of the lesions of the vertebrae, but she does have radio-detectable mild degenerative arthritis and ossifying lesions of both stifles. (2) A female Boxer, 7 years old, was subjected to a lateral recumbent radiograph (fig. 2) because of an incidental abdominal ailment. Attention is called to the appearance of the lumbar vertebrae. The owner had not been aware that the dog was suffering from back trouble.

Here Is the Diagnosis

(Continued from preceding page)

Diagnosis.—Ankylosing spondylitis of the lumbar vertebrae.

Comment.—Many dogs after middle age have ossifying lesions of the lumbar vertebrae. Spondylitis of other than the lumbar region is rare in our experience. (We have only one radiograph showing thoracic spondylitis and none with cervical spondylitis.) Few dogs with spondylitis of the lumbar vertebrae show any signs of disability that can be attributed to the involved area. This condition is usually limited to the ventral portion of the vertebral bodies; therefore, no pressure is exerted on the spinal cord or spinal nerves and the associated inflammation does not seem to be painful. The dog in case 1 has degenerative arthritis of the stifles; restricted articular movement of the back may have indirectly contributed to poor positioning of the hind limbs which may have resulted in unusual wear of the stifle joints. The dog in case 2 may have some narrowing of the foramen at the junction of the last lumbar and first sacral vertebrae. From our experience, it appears that lumbar spondylitis is not necessarily a crippling disease.

This report was submitted by Dr. Erwin Small, Department of Clinics, School of Veterinary Medicine, University of Illinois, Urbana, and was prepared with the assistance of Wayne H. Riser, D.V.M., M.S., Kensington, Md.

Our readers are invited to submit histories, radiographs, and diagnoses of interesting cases which are suitable for publication.

reunion

A happy time for both the dog and the owner. And a time when you can be rightfully proud. For you've taken good care of your boarder. The dog's a little sleeker now, full of fun and healthy as can be. This is sure to please the owner, makes you first choice for next time.

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breaks the resistance barrier to clinical recovery

URINARY TRACT INFECTION: FURADANTIN therapy achieved clinical recovery in over 90% of the cases of acute or chronic urogenital disease in dogs and cats.² Pronounced symptomatic improvement occurred by the 4th day and complete recovery within 7-14 days.³ Coles states, "One of the advantages of nitrofurantoin [FURADANTIN] in the treatment of canine nephritis is the fact that most microorganisms do not develop resistance to the drug, even after long periods of exposure to it."⁴

INDICATIONS: nephritis, cystitis, pyelonephritis; pre- and postoperative care of the urethra and bladder; prophylaxis in catheterized patients; and as an adjunct to surgical drainage in canine prostatic abscess.

CANINE TRACHEOBRONCHITIS: FURADANTIN constitutes modern, effective treatment for dogs with "kennel cough". When given orally for 5 days, FURADANTIN stopped coughing in 95% of 75 cases. In some animals, signs frequently subsided in 48 hours.⁵ Mosier concludes, "In our experience, Furadantin has been considerably more effective than the various bacterins, antibiotics, vaccines, iodides, and chemotherapeutic agents which have been recommended for the treatment of tracheobronchitis in the past."⁵

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FURADANTIN Ora-Bols® Veterinary, provides 50 mg. FURADANTIN in an excipient containing dextrose. Bottle of 100, scored, 50 mg. Ora-Bols.

FURADANTIN Tablets Veterinary, bottles of 100, scored, 10 mg., and 100 mg. tablets.

FURADANTIN Oral Suspension Veterinary, provides 5 mg. FURADANTIN in each cc. Bottles of 60 cc.

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Nitrofurans—a unique class of antimicrobials—neither antibiotics nor sulfonamides

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REFERENCES: 1. Michaelson, S. M., and Covert, M.: J. Am. Vet. M. Ass. 134:334 (Apr.) 1959. 2. Mosier, J. E., and Coles, E. H.: Vet. Med. 53:619 (Dec.) 1958. 3. Belloff, G. B.: Calif. Vet. 9:27 (Sept.-Oct.) 1956. 4. Coles, E. H., and Mosier, J. E.: Am. J. Vet. Res. 20:1020 (Nov.) 1959. 5. Mosier, J. E.: Vet. Med. 52:445 (Sept.) 1957.



EATON LABORATORIES, NORWICH, NEW YORK

Quiz for Quidnuncs

1. Of what value are organic iodides in treatment of foot rot in cattle? Page 599.
2. What causes development of a bipartita patella in dogs? Page 607.
3. How may cutaneous candidiasis in a dog be diagnosed? Page 614.
4. What effect do rations have on success of hog cholera immunization? Page 620.
5. What is "red spot" in chickens? Page 626.

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Keep your dog clipped the year 'round for a healthier, cleaner pet. Clipped dogs look better, feel better, shed less, have fewer skin disorders, and are easier to keep clean. Clipmaster animal clipper has powerful, cool-running motor. Perfect tension control makes blades last longer. Special bottom clipping blades available for all breeds of dogs. Sunbeam Stewart Clipmaster animal clipper is available at all good hardware and implement dealers. \$49.95 (Colorado and West \$50.25).

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Malpractice Difficult to Prove

The veterinarian must exercise due professional skill, but to prove lack of it, that is, malpractice, is difficult in court. Expert witnesses must testify that the actions of the veterinarian were out of place, nonprofessional, and negligent, based upon a hypothetical case. Other witnesses must testify only on what they saw or heard and, as we know, few dog owners stand over the veterinarian at all hours while the dog is in his hospital.

In most cases, there has been no malpractice, but, instead, a sorrowing dog owner permitting blind love to dictate his judgment.—*All-Pets, 30, (1959): 80.*

Sheep Practice Tips

Sheep are particularly conscious of a stranger in their midst, and costly damage can result if a flock of brood ewes is frightened. The owner should always precede the veterinarian. Individual animals or groups of sick sheep should not be isolated for examination because reaction to strange surroundings may interfere with diagnosis.—*Iowa Vet., 30, (1959): 11.*



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History of the AVMA

Following the highly successful meeting in Philadelphia, the semiannual meeting for 1888 in Baltimore was adjudged "the best and most fruitful in useful results of all that have hitherto been held." Evidently this set the stage for making the Association truly representative of the veterinary profession by moving the meetings from place to place. At least beginning with the Philadelphia meeting, no two consecutive conventions have been held in the same city (except in 1945 when a business meeting only was held in Chicago following the regular meeting there in 1944).



Dr. R. S. Huidekoper, USVMA president from 1887 to 1889, and from 1890 to 1892.

The Baltimore meeting was highlighted by two papers from D.E. Salmon; one on "Hog Cholera" reviewed the work of the Bureau which, despite the inadequate evidence adduced to that time, produced several truths which still stand: it faithfully described the lesions of hog cholera, said "that hog cholera was a distinct and very different disease from *rouget*" (hemorrhagic septicemia); and hog cholera "is a strictly contagious disease." On the latter, Billings contended that ". . . such an assertion is supremely ridiculous and shows a lamentable ignorance of the modern classification of disease."

In his paper on "Mediate Contagion in Pleuropneumonia," Salmon explodes the theory that the disease could be propagated only by direct contact of infected animals, and charges: "The propagation of these erratic views, . . . have done much to cause distrust of veterinary counsel and to impede the progress of the work."

At the annual meeting in New York, the subject of tuberculosis received considerable attention, with Dr. Zuill, chairman of the Committee on Diseases, referring "very forcibly to the dire need of legislative action relative to the checking of the progress of [this] disease." Drs. Liautard, McLean and Clements were named: "To draft a series of resolutions, relative to the rapid increase, the dangers from ingestion of meat and milk from tuberculous animals; the need of properly qualified veterinarians, as inspectors of dairies, markets and slaughter houses." These resolutions were to be sent to the Medical Congress in session at Washington, D.C., and to all state and national boards of health.

Dr. Huidekoper was re-elected president, and Dr. Robertson, treasurer; C.B. Michener was succeeded as secretary by W. Horace Hoskins; D.J. Dixon was made vice president. The matter of ethics appears to have become a live issue: two members were expelled "for violations of the Code of Ethics," and two men were refused admission "on the grounds of unprofessional conduct."

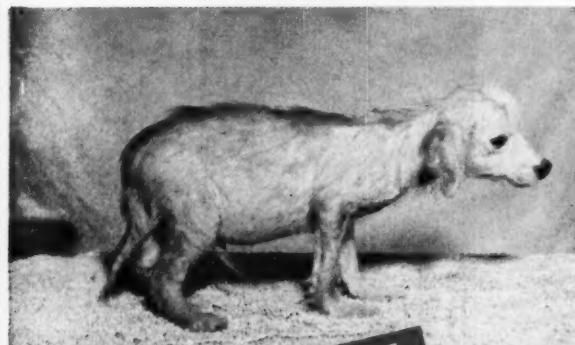
RUSH SHIPPEN HUIDEKOPER, M.D., V.S., was born at Meadville, Pa., May 3, 1854. He was graduated from the Medical Department of the University of Pennsylvania and began medical practice in 1877. In 1881, he studied veterinary medicine at Alfort, France, and worked in the laboratories of Virchow, Koch, Chaveau, and Pasteur. A descendant of Benjamin Rush, who had urged the establishment of a veterinary school at the University of Pennsylvania in 1806, Dr. Huidekoper became the founder of this school in 1884 and served as its dean for five years. In 1889, he moved to New York and served on the faculties of the American Veterinary College and the New York College of Veterinary Surgeons.

During the War with Spain, he was chief surgeon of the First Army Corps, for which he was abused by the press as being a "horse doctor." Twice elected to the presidency of the USVMA (1887-89, 1890-92), he was the only man to be so honored. A man of independent means, Dr. Huidekoper taught and served the veterinary profession for the sheer love of it. He is credited with originating laboratory and practical instruction for veterinary students in the United States. The author of two books and numerous articles, he also served as editor of the *Journal of Comparative Medicine and Surgery* from 1886 to 1901. He died in Philadelphia on Dec. 17, 1901, following an attack of pneumonia.

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1. "Clinical Evaluation of a Drug for Dermatoses of Dogs and Cats," Wenger, J. B., Vet. Med., 55:55-58, Mar. 1960.

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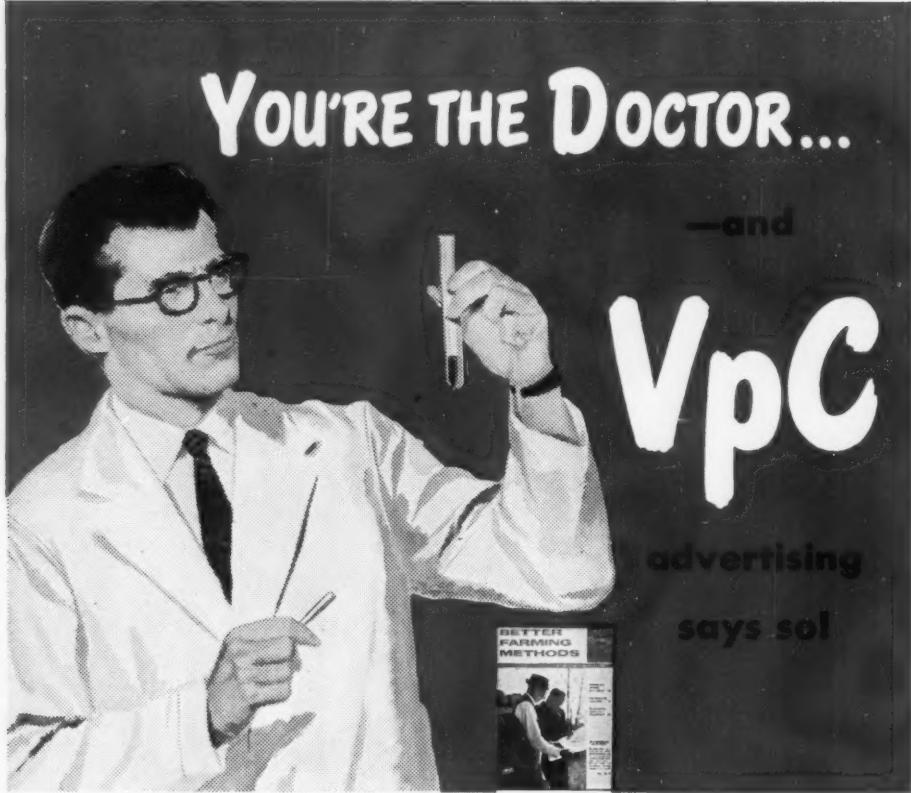
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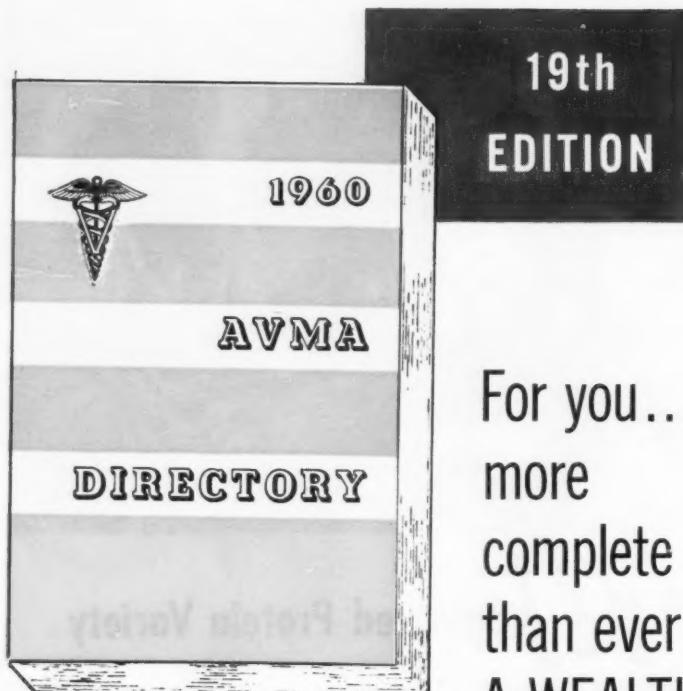
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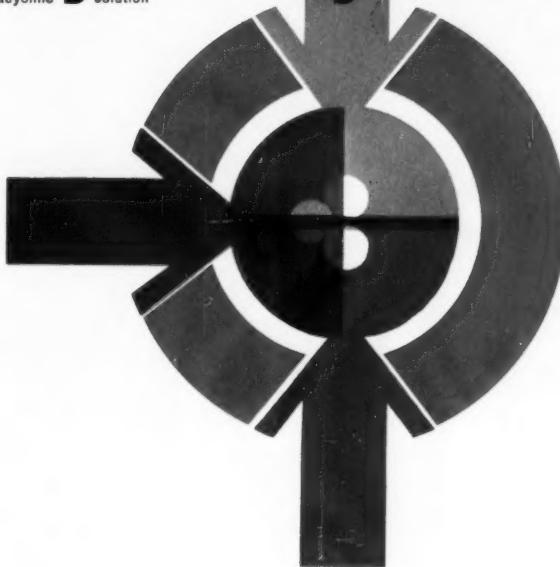
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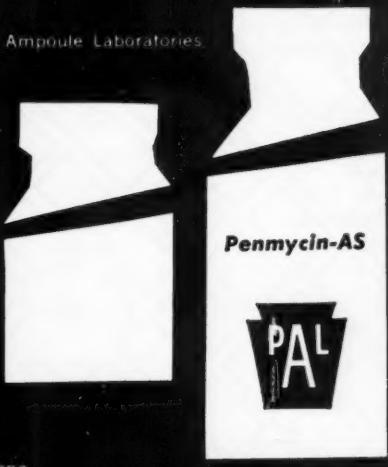
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HOTEL INFORMATION—DENVER, COLORADO, CONVENTION

Ninety-Seventh Annual AVMA Meeting, Aug. 14-18, 1960

All requests for hotel accommodations will be handled by a Housing Bureau in cooperation with the Denver Convention and Visitors Bureau. The Bureau will clear all requests and confirm reservations.

Hotel and Rate Schedule

(See Location, by Number, on Map of Downtown Area)

Map No.	Hotel	Single (1 person)	Double bed (2 persons)	Twin bed (2 persons)	Suites	Sets-2 rooms connecting bath (2-3-4 persons)
1	Adams*	\$5.50-7.50	\$ 7.50-9.00	\$ 8.50-10.50	\$13.50-15.00	\$ 9.50-16.00 (1 Room, 2dbl. beds)
2	Albany†	6.50-9.50	10.00-12.00	12.50-14.00	30.00	- - - - -
3	Ambassador	5.50-6.00	7.00-7.50	9.00	- - - - -	- - - - -
4	Argonaut*†	6.50-9.50	8.50-11.00	9.50-12.50	- - - - -	13.50-17.50
5	Auditorium*	5.00	6.50	7.00	- - - - -	8.00-12.00
6	Broadway Plaza†	8.00-10.00	10.00-12.00	12.00-14.50	18.00-28.00	- - - - -
7	Brown Palace†	9.00-15.00	13.00-17.00	14.00-19.00	22.00-70.00	18.00-22.00
8	Colorado*	4.50-6.00	6.00-10.00	8.00-12.00	- - - - -	14.00-20.00
9	Cory	5.00-7.00	6.00-9.00	6.50-9.00	- - - - -	- - - - -
10	Cosmopolitan*	8.50-11.00	12.00-18.00	14.00-20.00	22.00-60.00	- - - - -
11	Hillview	9.00-11.50	10.00-12.00	12.00-13.50	16.00-18.00	- - - - -
12	Hilton*†	HEADQUARTERS HOTEL — Reserved exclusively for official convention use.				
13	Kenmark (not a/c)	4.50-6.50	6.00-7.00	7.50-8.00	- - - - -	6.00-12.00
14	Mayflower*	7.50-14.50	8.50-16.50	12.50-18.50	- - - - -	- - - - -
15	Olin*	5.00-7.00	9.00-11.00	10.00-12.00	- - - - -	11.00-16.00
16	Oxford	5.00-10.00	6.50-10.00	8.50-11.00	13.00-16.00	- - - - -
17	Sears	5.00-6.00	6.50	7.50	- - - - -	14.00 (For 2-3-4 persons)
18	Shirley Savoy*	7.00-9.00	9.50-11.50	11.00-13.00	25.00	15.00-19.00

†100 per cent air-conditioned; in other hotels listed, majority of rooms air-conditioned.

*FAMILY PLAN—The above hotels offer a "family plan" whereby children under 12 years of age will be accommodated in the same room with their parents at no extra charge. If more than one room is required to accommodate children, the hotel will charge only the single rate for each room.

MOTELS—Reservations for motels in the Denver area may be made through the Denver Convention and Visitors Bureau, 225 West Colfax, Denver 2, Colo.

PLEASE USE APPLICATION ON REVERSE SIDE FOR HOTEL ACCOMMODATIONS

Application for Hotel Accommodations

1960 AVMA Convention — Denver, Colorado

The Convention and Visitors Bureau will make every effort to place you according to your expressed wishes or, if the accommodations of your choice are not available, the Housing Bureau will select one that is nearest to the preferred rate and location.

Please give us the complete information requested below. At least four choices of hotels, or more if you desire, are necessary. Arrange for double occupancy of rooms wherever possible; only a limited number of single rooms is available.

Date _____

Hotel First Choice

Hotel Second Choice

Hotel Third Choice

Hotel Fourth Choice

Room with bath for one person. Rate per room desired \$..... to \$.....

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Two rooms with connecting bath for persons:

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Rate per suite desired \$..... to \$.....

Check here if you desire accommodations on the FAMILY PLAN.

Arrival date hour A.M. P.M.

Departure date

If reservations cannot be made in one of the hotels indicated shall we place you elsewhere? Yes No

If you have a few days before or after the convention that you would like to enjoy in the mountains please check the appropriate box to receive free information:

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MAIL TO: Convention and Visitors Bureau, 225 West Colfax Avenue, Denver 2, Colorado

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COMING MEETINGS

Notices of coming meetings must be received 30 days before date of publication.

Purdue University. International symposium on growth: molecule, cell, and organism. Purdue University, Lafayette, Ind., June 16-18, 1960. For additional information, write: Dr. M. X. Zarow, Department of Biological Sciences, Life Science Building, Purdue University, Lafayette, Ind.

Georgia Veterinary Medical Association. Fifty-fourth annual meeting. Jekyll Island, Ga., June 19-21, 1960. A. M. Mills, 325 Pinecrest Dr., Athens, Ga., secretary.

Mississippi State Veterinary Medical Association, Inc. Annual meeting, King Edward Hotel, Jackson, June 19, 1960. Joseph W. Banson, P. O. Box 4223, Fondren Sta., Jackson, Miss., secretary-treasurer.

North Carolina Veterinary Medical Association. Fifty-ninth annual summer meeting. Grove Park Inn, Asheville, June 21-23, 1960. J. T. Dixon, 3026 South Main St., Winston-Salem, N.C., secretary-treasurer.

Utah Veterinary Medical Association. Annual meeting. Richfield, Utah, June 23-24, 1960. J.A. Thomas, P. O. Box 592, Provo, Utah, secretary.

California Veterinary Medical Association. Seventy-second annual meeting. Jack Tar Hotel, San Francisco, Calif., June 26-29, 1960. Mr. Ken Humphreys, 3004 16th St., San Francisco 3, Calif., executive secretary.

Iowa State University. Annual conference for veterinarians. Memorial Union, Iowa State University, Ames, July 12-13, 1960. Address the program committee at Iowa State for additional information.

Virginia Veterinary Medical Association. Summer meeting. Shoreham Hotel, Washington, D.C., July 17-19, 1960. G. B. Estes, State Office Building, Richmond, Va., secretary-treasurer.

Kentucky Veterinary Medical Association. Forty-ninth annual convention. Sheraton-Seelbach Hotel, Louisville, July 18-19, 1960. L. S. Shirrell, 545 East Main, Frankfort, Ky., secretary.

Nebraska, University of. Conference on Swine Repopulation. University of Nebraska, College of Agriculture, Agricultural Experiment Station, Lincoln, July 20-22, 1960. Inquiries should be directed to: Dr. Crosby Howe, Department of Animal Pathology and Hygiene, University of Nebraska, Lincoln 3.

Auburn University. Fifty-third annual conference for veterinarians. School of Veterinary Medicine, Auburn University, July 24-27, 1960. J. E. Greene, dean.

Continued on adt. p. 50



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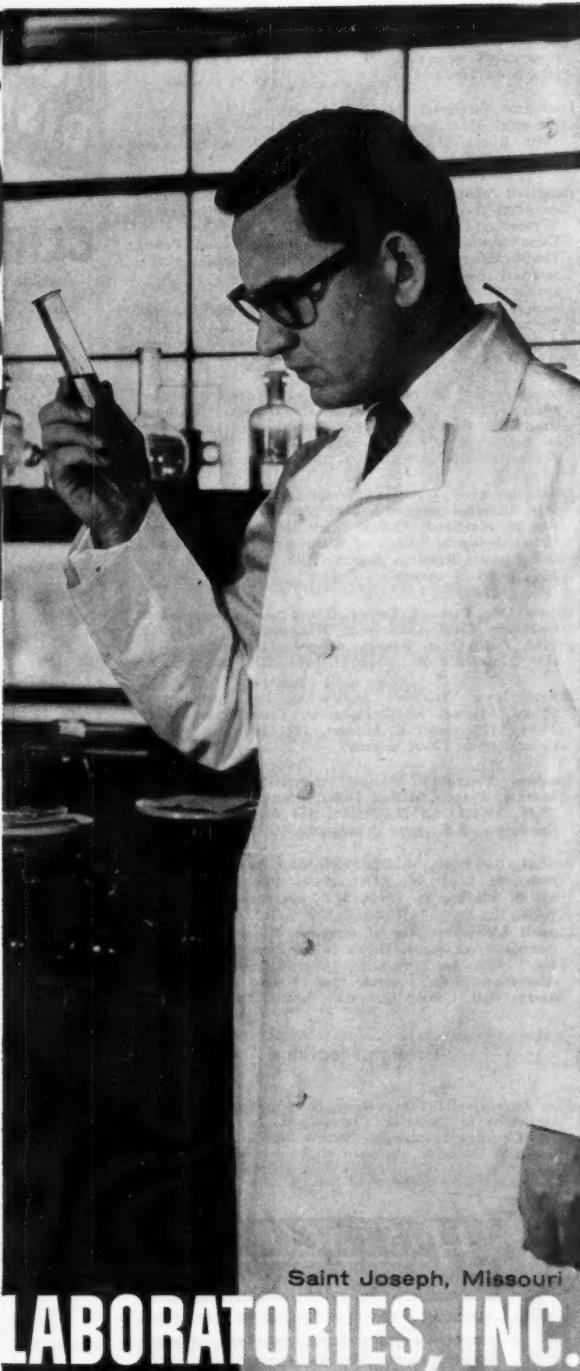
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Continued from adv. p. 48

Canadian Veterinary Medical Association. Twelfth annual meeting. Halifax, Nova Scotia, July 24-27, 1960. For reservations, write: Dr. M. D. Harlow, Box 1153, Halifax, Nova Scotia, Can.

Louisiana Veterinary Medical Association, Inc. Annual meeting. Monteleone Hotel, New Orleans, Aug. 1-2, 1960. Robert K. Morris, 406 W. McNeese St., Lake Charles, La., secretary.

American Association of Veterinary Bacteriologists. Annual meeting. Division of Veterinary Science, University of Wyoming, Laramie, Wyo., Aug. 13, 1960. Charles H. Cunningham, Department of Microbiology and Public Health, Michigan State University, East Lansing, Mich., secretary.

American Veterinary Medical Association. Ninety-seventh annual meeting. Denver-Hilton Hotel, Denver, Colo., Aug. 15-18, 1960. H. E. Kingman, Jr., 600 S. Michigan Ave., Chicago 5, Ill., executive secretary.

Armed Forces Institute of Pathology. Seventh annual course. Armed Forces Institute of Pathology, Washington, D.C., Sept. 26-30, 1960. Deadline for applications is August 15. To apply, write: The Director, Armed Forces Institute of Pathology, Washington 25, D.C.

Helminthological Society of Washington. Fifteenth anniversary. Scientific program will be conducted at the University of Maryland, College Park, Md., Oct. 8, 1960. Helminthological Society of Washington, Animal Disease and Parasite Research Branch, ARS, USDA, Beltsville, Md., publicity committee.

Gaines Dog Research Center. Tenth annual symposium. Kankakee Civic Auditorium, Kankakee, Ill., Oct. 12, 1960. Dean C. A. Brandy, School of Veterinary Medicine, University of Illinois, Urbana, Ill., chairman.

Eastern Iowa Veterinary Association, Inc. Forty-seventh annual meeting. Hotel Montrose, Cedar Rapids, Oct. 13-14, 1960. Grant B. Munger, 1921 First Ave., S.E., Cedar Rapids, Iowa, secretary.

Southern Veterinary Medical Association, Inc. Annual meeting. Francis Marion Hotel, Charleston, S.C., Oct. 23-26, 1960. Otto M. Strock, 461 Maybank Highway, Charleston, S.C., general chairman.

Animal Care Panel. Annual convention. Sheraton-Jefferson Hotel, St. Louis, Mo., Oct. 26-28, 1960. Herbert Graff, 835 S. 8th St., St. Louis, Mo., convention secretary.

Cornell University. Annual nutrition conference for feed manufacturers. Statler Hilton Hotel, Buffalo, N.Y., Nov. 2-4, 1960. For programs, preregistration and hotel reservation cards, contact: Prof. Harold H. Williams, Savage Hall, Cornell University, Ithaca, N.Y., chairman.

Foreign Meetings

First International Congress of Endocrinology. Technical University of Denmark, Copenhagen, July 18-23, 1960. Dr. Christian Hamburger, Statens Serum Institut, Copenhagen S, Denmark, chairman of the executive committee.

Continued on adv. p. 52



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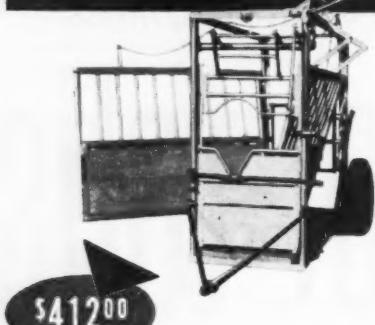
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Continued from adv. p. 50

Second International Course on Lyophilization. Lyon, France, Aug. 29—Sept. 9, 1960. For full details, contact: Dr. Louis R. Rey, Directeur des Cours Internationaux de Lyophilisation, Laboratoire de Physiologie, Ecole Normale Supérieure 24, rue Lhomond, Paris 5, France.

Fourth International Congress on Animal Reproduction. The Hague, Netherlands, June 5-9, 1961. For additional information contact: the Secretariat of the Fourth International Congress on Animal Reproduction, 14, Burghmeester de Monchyplein, The Hague, Netherlands, Dr. L. Hoedemaker, secretary to the organizing committee.

Eighth International Congress of Animal Husbandry. Hamburg, Germany, June 13, 1961.

A Loaf of Bread, a Jug of Wine, —and a Polar Bear?

Italian bread, meat balls and champagne have been supplementing the diet of Mike, the Lincoln Park polar bear, Chicago zoo officials discovered recently.

A 31-year-old Chicago steel broker, who



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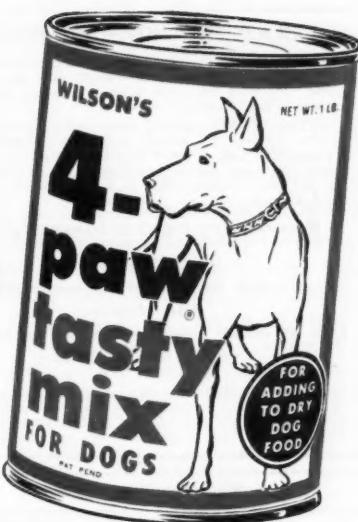
Mike, 4-year-old Lincoln Park polar bear, stretches to his full 9 feet, 10 inches.

considers Mike a "pet away from home," was apprehended by a night watchman as he climbed over the guard rail with Mike's lunch, ordered from a nearby night club.

The man admitted to police that he frequently takes a taxi to the zoo to share an evening snack with Mike. He was charged with disorderly conduct.—Chicago Sun-Times, April 20, 1960.

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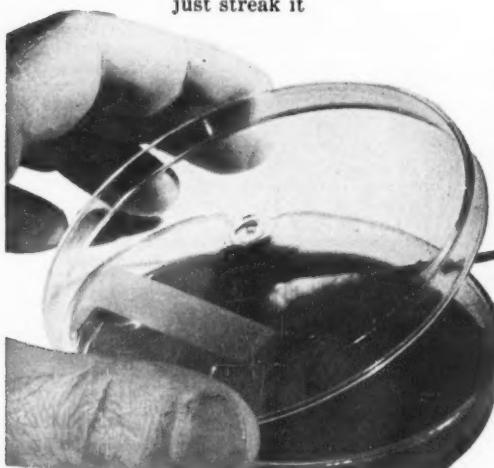
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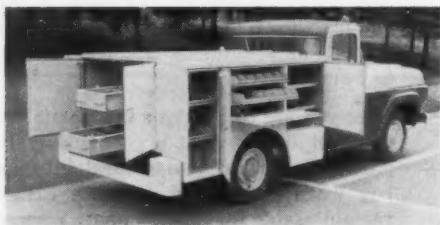
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